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A study of suburban bird-life at Dollis Hill

By Eric Simms

(Plates 1-2)

INTRODUCTION

UNTIL THE PRESENT TIME no thorough or systematic survey of the distribution and behaviour of the birds of a suburban area has appeared since F. D. Power's *Ornithological Notes from a South London Suburb, 1874-1909*, published in 1910. This paper sets out the results obtained by the author from the study of Dollis Hill, a suburban area in north-west London. It is based on detailed observations carried out over a period of more than ten years from January 1951 to the summer of 1961, when I lived in the district, as well as on spasmodic observations from August 1943 to December 1950, when I was a frequent visitor. The area chosen for study lies within 1,250 yards or less of my home and can be comfortably managed by one observer; it contains five major habitats forming a fascinating, almost exclusively man-made, ecological unit.

DESCRIPTION AND HISTORY OF THE AREA

The study area lies some five miles north-west of Marble Arch. It consists of approximately 546 acres (or five-sixths of a square mile) and is contained in a rectangle formed to the north by the North Circular Road, to the west by Dudden Hill Lane, to the east by the Edgware Road and to the south by the Midland Region railway line of British Railways (formerly part of the Midland and South-Western Junction Railway). This rectangle of land is just over a mile across from west to east and slightly more than three-quarters of a mile from north to south (see Fig. 1). The area has the form of a shallow cone on the London clay. The land rises from between 115 and 172 feet above sea-level on the periphery to the highest point of 251 feet immediately to the east of the Post Office Research Station.

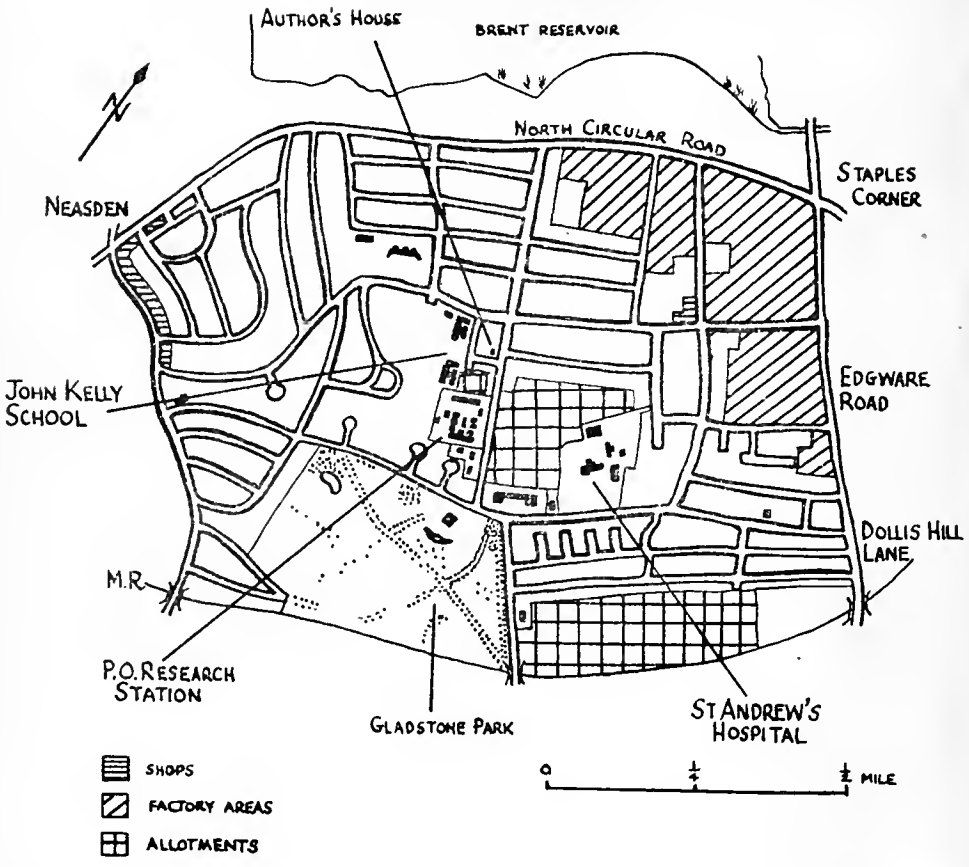


FIG. 1. Map of the area studied at Dollis Hill, London, during 1951-61, showing the major buildings, residential parts, factories, parkland and allotments

Immediately to the north lies the Brent Reservoir and, although it has some effect on the bird-life of the selected area, it was deliberately excluded so that undue weight would not be given to any birds occurring in this rather specialised habitat. The ways in which the reservoir has any clear influence on the birds of Dollis Hill will be examined at various points in this paper. An aerial photograph of the study area and the reservoir is reproduced on plate 1.

At the time of the Enclosure Award of 1816, the study area consisted of a 16th century farm at Oxgate (still in 1961 the oldest building in the Borough of Willesden), another farm at the top of Dollis Hill, a mansion known as Neasden House and some 75 fields resulting from the enclosure. The region was typical open farming country and the only road across the area was Dollis Hill Lane which traversed it from east to west. Dollis Hill House was built in 1825 and the railway which provides the southern boundary to the area in 1868. By 1895 the south-western corner had become occupied by a golf-course.

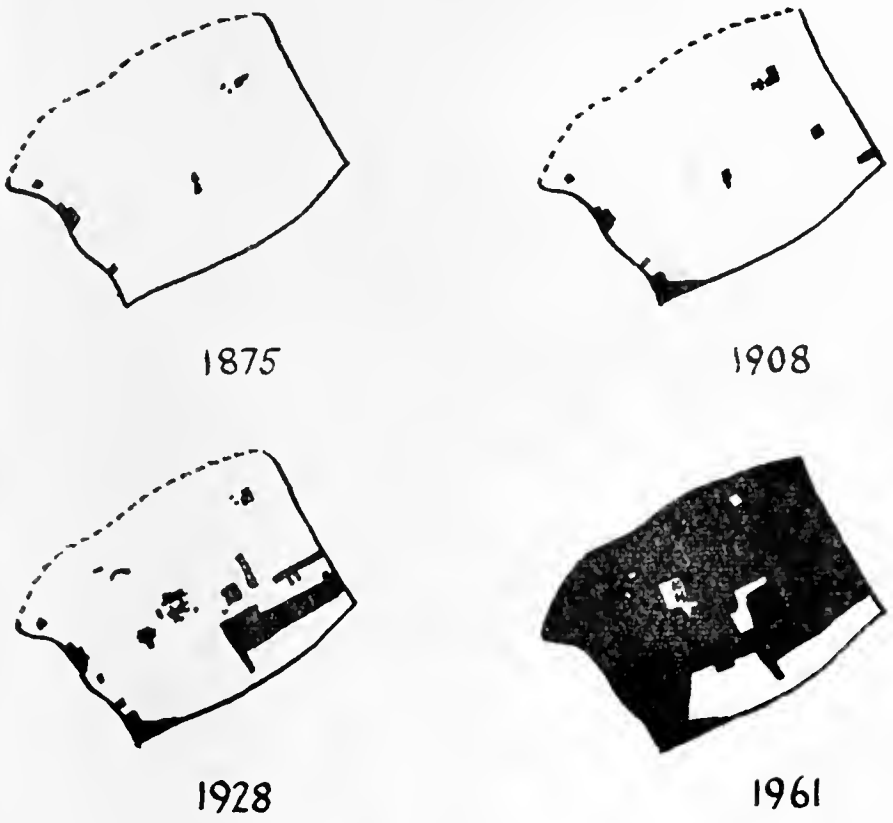


FIG. 2. The study area at Dollis Hill, London, at intervals from 1875 to 1961, with the built-up parts in black

Residential building really started in the south-east from 1907-08, with a few houses as well in the south-west corner.

At this time breeding birds of the area included such species as Sparrowhawk,* Partridge, Corncrake, Cuckoo, Wryneck, Skylark, Swallow, Magpie, Treecreeper, Blackcap, Garden Warbler, Whitethroat, Lesser Whitethroat, Bullfinch and Yellowhammer (Dixon 1909 and Kendall 1907).

Of the major landmarks constructed in the first quarter of the century, the two most noteworthy are St. Andrew's Hospital, built in 1913, and the Post Office Research Station which rose in 1923 on the site of the old Dollis Hill Farm. In the mid-1920's Edgware Road was developed and there was some small-scale building in the middle of the area.

So far a large part of the study area still retained much of its rural character, but a great transformation took place between 1928 and

*The scientific names of all birds mentioned in the text can be found in the summary appendix on pages 35-36; otherwise they are given only in the tables.

1930 when 29 new streets were laid out in the centre and there was further development in the two southern corners; this was also the period in which the North Circular Road was built. From 1930 to 1932 further building pushed into the western end and into the factory area of the north-east. Within the next three years the total development of the western side of the area was completed. Since then there have been some extensions to factory premises, and a few houses and small blocks of flats were built after the war. The John Kelly Schools went up in 1958 on open land north of the Research Station. Fig. 2 shows the dramatic changes that took place in the area between 1928 and 1961.

HABITAT

Today the study area can be conveniently divided into five main habitats and these will be described in order of size.

1. Residential area

This comprises private houses and their gardens, roads and a few small blocks of flats, and represents some 60% of the total area. In all, there are slightly more than 3,600 houses in the 330 acres of the residential district. Most of these houses are either terraced or semi-detached with small front gardens typically bordered by low walls, railings, fences or privet hedges. Many have some grass in the front, often with hydrangeas, roses and perennials, but increasing numbers of front gardens have been concreted in. This has generally been to save labour or, during the last decade, in the case of terraced houses, to give parking space for the cars that have come with increased affluence. The effect of this is to concentrate birds in feeding areas; it has certainly not yet resulted in a decrease in numbers. Plate 2 shows a typical road and front garden in the residential area.

The average back garden is some 20 feet wide and varies from 50 to 100 feet in length. Exceptionally, a few semi-detached and detached houses have back gardens of 200 feet in length. Most of the back gardens are separated from each other by wooden fences or palings, chain-link or walls, and there has been a slow but steady reaction against the privet hedges so popular 25 years ago. The most striking thing about the majority of these gardens is that the top layer of tree or shrub growth is only about 20 feet high and in many gardens is far lower than this. Many I have seen, although they are 30 years old, have no vegetational growth above six feet; one had a black currant bush as the tallest plant within it! The higher growth to 20 feet or so is largely accounted for by ash-trees, flowering cherries, laburnums, lilacs, sycamores and by fruit-trees such as apples, pears,

plums and damsons. A small number of ancient oaks, mostly stag-headed, were incorporated in the estate when it was laid out; these raise their strange archaic forms above the red-tiled roof-tops and provide occasional perches for Carrion Crows, Common Gulls, Black-headed Gulls and Starlings. There are also a few elms and Lombardy poplars in the garden areas.

Quite a number of the roads in the residential area have trees planted on both sides. The estate builders who began this were responsible for some not really suitable species that were included. The commonest trees in the roads are two species of elm (including the Jersey elm), three varieties of mountain ash, the London plane, the horse chestnut, the tree-of-heaven, the sycamore, two species of acacia and four varieties of Norway maple. Other trees include the silver maple, the native silver birch, seven species of *Crataegus*, the laburnum, the white and necklace poplars, three species of *Prunus*, the white beam, the crab apple, the white willow, the broad-leaved lime and a variety of ashes. A few, ancient indigenous elms survive along Dollis Hill Lane, the pre-estate road north of Gladstone Park.

The greater part of the residential area, as will be seen in Fig. 1, lies in the centre and west of the district. The typical breeding birds here are the House Sparrow, Starling, Blackbird and Dunnock. A few pairs of Woodpigeons breed in roadside trees, especially elms and horse chestnuts, and in garden trees of sufficient height. Tits, Wrens and Robins cannot usually find nesting sites in these gardens, and the Song Thrush—no more than an occasional winter visitor to some of them—will only rarely attempt to nest, since there are few evergreens or shrubs of sufficient height or density to give it the protection it needs.

2. Factory area

The second habitat is made up of the northern block of factories along the North Circular and the Edgware Road, as well as the Post Office Research Station which I have included here because of its massive and extensive nature. These and their surrounds represent some 15% of the total area. Most of the factory structures are slab-like and up to 60 feet in height; they usually have mown or unmown grass or rough ground in their immediate neighbourhood. The research station is an agglomeration of buildings; some of concrete or brick are of great height and dominate the top of Dollis Hill while other buildings are lower and of a less permanent nature. There is a small lake in the grounds frequented by Mallard.

The typical nesting species of this area are the Feral Pigeon, House Sparrow, Starling and Pied Wagtail. Carrion Crows use all these high buildings as perches or meeting places; one of their favourite assembly

points is on the radio-masts of the research station. Blackbirds will occasionally sing from factory roof-tops and a pair once bred in a workshop.

3. Parkland

Included in this section are some 70 acres of Gladstone Park (north of the railway line) and a small part of the grounds of St. Andrew's Hospital with tall trees, some hollies and grass; these together represent 13% of the total area. Gladstone Park is most pleasantly sited on the southern slopes of Dollis Hill. The park incorporates Dollis Hill House—a favourite resort of W. E. Gladstone as the guest of Lord Aberdeen—as well as a swimming pool, a small lake near the house, tennis courts, playing fields, a bowling green and a formal walled garden. For some years after the last war much of the lower part of the park was under cultivation and a pair of Skylarks bred there every year from 1946 to 1951. The land was then rehabilitated and the larks disappeared.

Today most of the park consists of grass, intersected by several fine avenues of London planes up to 70 feet in height. A number of the original oaks and elms, dating from the period of the private house and including some magnificent trees, are scattered over the grass. There are also black poplars, horse chestnuts, and a few cherries, almonds, hawthorns, Lombardy poplars, willows and other trees. Shrubberies are few and easily penetrated by children. Only one shrubbery has any real cover and this is made up of laburnums, cherries, laurustinus and tamarisk growing through a thicker layer of berberis, flowering currant and *Cydonia japonica*. This is an important roost for thrushes. The typical nesting species of this habitat are Mallard, Woodpigeon, Tawny Owl, Carrion Crow, Great Tit, Blue Tit, Wren, Mistle Thrush, Song Thrush, Blackbird, Robin, Spotted Flycatcher, Dunnock, Starling, Greenfinch, Chaffinch and House Sparrow. A single pair of Stock Doves held on until 1952, bred in 1954 and may have done in 1953, 1956 and 1957 as well. Since 1957 I have not seen a single bird in the park. The shooting of Woodpigeons from 1960 onwards would perhaps have provided too much disturbance for them had they stayed.

4. Allotments

There are five areas of allotments in the district. One is too small to have any significance and another has reverted to rough grassland. The other three are of considerable importance and can be seen in Fig. 1. The largest is in the eastern corner between Dollis Hill Lane and the railway line: the second lies on two sides of St. Andrew's Hospital and the third is immediately to the north of the Post Office Research Station. These allotments make up 10% of the total area.

The allotments in varying stages of cultivation, with their occasional dense hawthorn, elder and bramble bushes are important feeding areas for many birds especially thrushes, Woodpigeons, Wrens, Robins, finches and sparrows. Mallard breed in some of the grass tussocks, Song Thrushes and Blackbirds in the bushes, Wrens and Robins in low cover and against wooden fences. In the migration seasons, warblers of several species are regular visitors. A small shallow pond on the allotments immediately to the west of the hospital, still with *Iris pseudacorus* and *Typha latifolia* growing in it, is often visited by Mallard and provides a drinking place in all winters and some summers for many different species.

f. Special area

This, the fifth habitat, comprises only 2% of the study area and yet it is one of the most important. It consists of three parts: the first is a belt of sycamores, elms, limes, ashes, horse chestnuts and ancient oaks, with a ground cover of cow parsley, bluebells, nettles and ivy and a tangled mass of hawthorn, privet, elder and willow at one end; the second is an orchard with rough grass; and the third consists of working or disused chicken-runs.

This special area with its rural qualities is a veritable bird sanctuary. The breeding species include Woodpigeon, Carrion Crow, Great and Blue Tit, Wren, Song Thrush, Blackbird, Robin, Dunnock, Starling, Greenfinch, Goldfinch, Chaffinch, Tree Sparrow and House Sparrow. Here the Blackcap and the Willow Warbler have also nested.

NUMBER OF SPECIES RECORDED IN STUDY AREA

Since observations first began I have recorded 70 different birds in the area, and it is interesting to note that 52 of these have occurred in or over my own garden in Brook Road. The total of 70 species can be sub-divided in the following way:

Regular breeders	21
Former or occasional breeders	4
Present in summer but not breeding	3
Winter visitors	6
Passage migrants	21
Occasionally flying over	3
Vagrants	12

This figure over a period of nearly eleven years compares favourably with the total of 63 species that I recorded in Ladbroke Square, Kensington (west London), over thirteen years.

SUMMER POPULATION

Table 1 shows the species breeding or present in the breeding season during each year from 1951 to 1961. It can be seen that the losses in this period have been the Stock Dove and the Skylark. The Jay has only recently come into the district: I have always wondered at the previous absence of this bird since it has for so long frequented the central London parks and squares, Paddington Cemetery and the northern bank of the Brent Reservoir.

TABLE 1—SPECIES BREEDING OR PRESENT IN BREEDING SEASON AT DOLLIS HILL, LONDON, 1951-61

B indicates breeding and *p* present but not breeding

	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961
Mallard (*Anas platyrhynchos*)	B	B	B	B	B	B	B	B	B	B	B
Kestrel (*Falco tinnunculus*)	*p*				*p*			*p*	*p*	*p*	*p*
Stock Dove (*Columba oenas*)	B	B	B?	B	*p*	B?	B?				
Feral Pigeon (*C. livia*)	B	B	B	B	B	B	B	B	B	B	B
Woodpigeon (*C. palumbus*)	B	B	B	B	B	B	B	B	B	B	B
Tawny Owl (*Strix aluco*)	B	B	B	B	B	B	B	B	B	B	B
Swift (*Apus apus*)	*p*	*p*	*p*	*p*	*p*	*p*	*p*	*p*	*p*	*p*	*p*
Skylark (*Alauda arvensis*)	B	B	B	B							
Carrion Crow (*Corvus corone*)	B	B	B	B	B	B	B	B	B	B	B
Jay (*Garrulus glandarius*)											*p*
Great Tit (*Parus major*)	B	B	B	B	B	B	B	B	B	B	B
Blue Tit (*P. caeruleus*)	B	B	B	B	B	B	B	B	B	B	B
Wren (*Troglodytes troglodytes*)	B	B	B	B	B	B	B	B	B	B	B
Mistle Thrush (*Turdus viscivorus*)	B	B	B	B	B	B	B	B	B	B	B
Song Thrush (*T. philomelos*)	B	B	B	B	B	B	B	B	B	B	B
Blackbird (*T. merula*)	B	B	B	B	B	B	B	B	B	B	B
Robin (*Erithacus rubecula*)	B	B	B	B	B	B	B	B	B	B	B
Blackcap (*Sylvia atricapilla*)		B?			B?	B?		B			
Willow Warbler (*Phylloscopus trochilus*)					B?	B?	B				
Spotted Flycatcher (*Muscicapa striata*)	B	B	B	B	B	B	B	B	B	B	B
Dunnock (*Prunella modularis*)	B	B	B	B	B	B	B	B	B	B	B
Pied Wagtail (*Motacilla alba*)	B	B	B	B	B	B	B	B	B	B	B
Starling (*Sturnus vulgaris*)	B	B	B	B	B	B	B	B	B	B	B
Greenfinch (*Chloris chloris*)	*p*	B?	B	B	B	B	B	B	B	B	B
Goldfinch (*Carduelis carduelis*)	*p*	B?	B	B	B	B	B	B	B	B	B
Chaffinch (*Fringilla coelebs*)	B	B	B	B	B	B	B	B	B	B	B
House Sparrow (*Passer domesticus*)	B	B	B	B	B	B	B	B	B	B	B
Tree Sparrow (*P. montanus*)	*p*	*p*	B	B	B?	B	B	B	B	B	B

From Table 1 it will be seen that the average number of breeding species during 1951-61 was 21, with a minimum of 20 and a maximum in 1954 of 23. These figures may be compared with the total of 22 nesting species discovered by E. C. Rowberry in 1936 during a census

of a built-up area in south-west London (Homes *et al.* 1957). Similarly, during 1954-59 the average breeding figure for Regent's Park and Primrose Hill was 25 species (Wallace 1961), and for Hyde Park and Kensington Gardens 19 species, while the average for St. James's and the Green Parks during 1954-58 was 16 (*Rep. Comm. Royal Parks*, 1953-54, 1955-56, 1957-58). The inclusion of the Brent Reservoir, which adjoins the study area, would have added only five more. It is clear, too, that the number of species is fairly static from year to year.

NUMBERS OF BREEDING PAIRS AND SELECTION OF NESTING SITES

In 1951 only two pairs of Mallard bred in the area; by 1961 the total had risen to seven or eight pairs. About 90% of all their nests have been in rough grass on allotments, in gardens or in the grounds of the Post Office Research Station. The remaining 10% have been in holes in elm-trees some 15-20 feet above the ground. When the ducklings hatch, the adults usually take them down to the Brent Reservoir, sometimes after journeys of more than 1,000 yards.

A very different bird which overlaps the breeding habitats of the Mallard is the Tawny Owl. From 1951 to 1956 two pairs nested in Gladstone Park and one pair in the hospital grounds. There was a fourth pair in the park from 1957 to 1959, but by 1960 the total breeding population in the area was reduced to two pairs. All the nests have been in holes in elms 20-25 feet above the ground.

Of the doves, some 14-15 pairs of Feral Pigeons breed (a rise since 1951 of 7-8 pairs), and about 36-40 pairs of Woodpigeons (nearly three times the number in 1951). The former species nests in roof-ventilators on the research station and on high ledges on a factory façade near Staples Corner; there are few available nesting sites in a comparatively modern estate. Woodpigeons have built in acacias, elms, London planes, ashes, horse chestnuts and several species of *Prunus*, but I have no records of buildings being used for breeding sites. Of 187 nests examined, one was six feet above the ground, eight were 10-15 feet, 132 were 15-20 feet and 46 above 20 feet. Woodpigeons sometimes nest in such dense foliage that access is difficult. Nests have sometimes been started in mid-March and I have known unfledged young in early October.

A single pair of Carrion Crows bred in Gladstone Park from 1943 to 1961, and a second pair in 1953 and 1958. Another pair also nested in the grounds of St. Andrew's Hospital during 1951-56 and 1960-61. Of the 29 nests seen, 20 have been in elms, eight in sycamores and one in a black poplar. Crows forage over a wide area and it would seem unlikely that the status of this species will alter much in the immediate future.

Only two species of tit nest regularly. The annual breeding population of Great Tits varies from five to six pairs; most of the nests are in stack-pipes, hollow trees and old walls. The number of breeding pairs of Blue Tits remains fairly constant at about nine pairs. Nesting sites are similar to those of the Great Tit, but the Blue Tit will more readily use nest-boxes in private gardens, and for this reason the larger species is almost entirely absent from these areas in the summer. The Wren is confined in the breeding season to Gladstone Park, St. Andrew's Hospital and the adjoining allotments. Here some seven pairs nest each year amongst creepers and ivy on fences and sheds, and in holes in old walls.

At Dollis Hill the Mistle Thrush is a marginal species. Its main stronghold is in the park where two pairs bred from 1951 to 1954 and one pair only from 1955 to 1961. There has been one attempt to extend this range and that was when a pair nested successfully some 25 feet up in a tall Lombardy poplar in a private garden near my home; this tree was felled the following winter. All the nests have been built between 18 and 30 feet above the ground, usually in London planes, but sometimes in elms, oaks and hawthorns. The Song Thrush, on the other hand, is represented by six to eight breeding pairs. The chief limiting factor on its distribution is its conservative choice of nesting sites; all the nests examined have been five to 15 feet above the ground and, with one exception, in hollies or hawthorns. Dixon (1909) called the Song Thrush "the commonest thrush" in north-west London, but now the Blackbird easily outnumbers it by 26 or 27 to one. During 1951-57 and 1959-61 between 185 and 195 pairs of Blackbirds bred at least once each year in the area, and in the very wet summer of 1958, when insect food was plentiful, the total rose to more than 200 pairs. With the Blackbird, two broods are regular and three not uncommon; in 1958 a pair that had built on top of a partially finished House Sparrow's nest on a rain-pipe beneath the gutter of a neighbour's house successfully raised four broods in the same nest. At one stage the male of this pair was simultaneously feeding the fledged young of the third brood and the newly hatched nestlings of the fourth. Most of the nests have been in trees and bushes, especially ashes, London planes, pears, plums, ornamental cherries, horse chestnuts, hawthorns, elders, almonds, syringas, weeping willows, and roses on stumps and fences. A pair once built on top of a clock in a workshop at the Post Office Research Station. Table 2 summarises the heights above ground and the situations of all the Blackbird nests found in the area.

The Robin is confined in the breeding season to Gladstone Park, the grounds of St. Andrew's Hospital and some allotments. Seven to eight pairs nest each year in wall cavities or dense creeper, or in grassy

TABLE 2—HEIGHTS AND SITUATIONS OF 611 BLACKBIRD (*Turdus merula*) NESTS AT DOLLIS HILL, LONDON, 1951-61

0-5 feet	5-10 feet	10-15 feet	15-20 feet	20-25 feet	25-30 feet
4	510	56	22	16	3

In trees and bushes	In creeper on walls	On pipes on walls	On ledges of fences	On stacked ladders	In sheds and buildings
497	16	15	76	3	4

banks on the allotments. Robins avoid the private gardens in the summer as there are no suitable nesting sites for them.

In 1958 a pair of Blackcaps built six feet up in an elder and in 1957 a pair of Willow Warblers brought off a brood in a nest in rough grass. The Spotted Flycatcher, however, has changed its status little since Kendall (1907) reported two pairs at Dollis Hill. During 1951-61 a pair has come each year and usually nested about six feet up against a wall in the north-eastern corner of Gladstone Park; a second pair bred in the grounds of the research station in 1956. Two pairs of Pied Wagtails, separated by about half a mile, nest at the research station and at one of the factories along the North Circular Road; these depend on the Brent Reservoir and a small lake by the research station for access to water.

The next two breeding species are closely associated with man. The Dunnock is widely distributed, with the annual number of breeding pairs varying from 45 to 50. It is essentially the bird of the privet and 99.5% of all the nests have been in hedges of this kind; tne other nesting sites have been in hawthorn and lilac. Of the 214 nests I have found, 84.6% have been between three and five feet off ground level and the remaining 15.4% between five and eight feet. The Starling is also a common resident and from 250 to 275 pairs nest each year in the study area; this gives a density of about 50 nests per 100 acres. However, as Nicholson (1951) pointed out, densities of 120 nests per 100 acres are known. Of the Starling nests at Dollis Hill, 92% have been in houses and buildings and only 8% in holes in trees. From 1952 to 1960 Starlings entered my own loft through a small gap under the lead covering to a bay window; it was necessary for the birds to squeeze and struggle for some five to eight seconds before they could get through, but each year a brood was successfully reared in this site.

Three species of finch breed in very small numbers each year and are strictly confined to the area of the park and the hospital. Three, sometimes four, pairs of Greenfinches nest in overgrown hedges or

shrubberies. One pair of Goldfinches has bred in every year since 1953 and may well have done so in the two preceding years; in 1956 and 1959 a second pair also nested. All the nests have been in hawthorns or apple-trees. Two pairs of Chaffinches breed in almonds or hawthorns in Gladstone Park and one pair in an apple-tree near the hospital. The finches are entirely dependent on the conditions available in these two areas and any changes in them could adversely affect the status of all three.

About 900 pairs of House Sparrows breed every year in the area, which gives a breeding density of 3.3 birds per acre. This figure can be compared with the density of 4.3 birds per acre found by S. Cramp in 43 acres of Bloomsbury in 1950 and with the 4.0 birds per acre counted in Lambeth by W. G. Teagle (Homes *et al.* 1957); however, in a suburb of Stockton-on-Tees, Co. Durham, Summers-Smith (1959) found a density of only one bird per acre. The total number of House Sparrows at Dollis Hill has remained constant throughout the decade, although S. Cramp has recorded a slow decline in central London. Nearly all the nests have been built in holes in roofs, ventilators and pipes. I also have records of five nests in hawthorns in Gladstone Park, of seven nests among creepers on walls and of one nest which was constructed in the open, resting on a rain-pipe where it curved towards the wall from the sheltering gutter above. Nests in my own loft have sometimes been built on the floor with open cups or suspended from the underside of a tile with the classical domed form. The chief materials used have been dried grass, especially common couch and annual meadow grass, roots and, from my own garden, the dry stringy leaves of the lily-of-the-valley. Feathers are often used for nest-linings and House Sparrows may travel as much as 400 yards to bring feathers from the hospital chicken-runs. Dog hairs are also collected. Breeding has taken place in every month of the year at Dollis Hill and two or three broods are usual. I have records of 153 broods being fed in October, 52 in November, 24 in December, 20 in January, 12 in February and 316 in March. Dead featherless nestlings are often found lying in the street.

Tree Sparrows were present in the summers of 1951 and 1952 in the special habitat area (page 7), but breeding was not proved until 1953. Since then two pairs have certainly nested in every year up to 1961. The nests have invariably been in holes in old oaks some 16-20 feet above the ground. In the same period Tree Sparrows have nested at Barn Hill, Mill Hill and the Brent Reservoir, but the tiny Dollis Hill colony is the nearest to the centre of London in this direction. The birds are sedentary all the year round and feed regularly on the allotments.

SIZE OF BREEDING POPULATION

Many censuses were regularly and systematically carried out each year to check and re-check the size of the breeding population, most being undertaken in the evenings or early mornings. In fact, more than 2,000 such counts were made during 1951-61, in order to arrive at as close as possible an estimate of the annual breeding population.

In 1951 the total number of breeding pairs of all species was between 1,445 and 1,500, giving a density of 52-53 birds per ten acres. The 1960 total was slightly higher—from 1,480 to 1,525 pairs—but this also gave a density of 52-53 birds per ten acres. This density figure can be compared with 19-22 birds per ten acres in Regent's Park (Wallace 1961), and my own records of 48 birds per ten acres in an area of north Oxford gardens in 1946 and 98 birds per ten acres in the Ladbroke Square district of Kensington before the last war.

Some of the national averages for breeding densities of birds per ten acres are as follows:

Rough grazing	7
Permanent grass	20
Deciduous woodland	40
Mixed woodland	50
Built-up areas	50
Parks	100

The figures for Dollis Hill are therefore comparable to those for mixed woodland and built-up areas. It would be most valuable to have a wide series of figures available for different kinds of area of houses and gardens. The high figure for Kensington suggests that more densely built-up areas with some open spaces may be more attractive to birds than suburban districts. Wallace's low figure is due largely to the presence of many open grass swards in Regent's Park. An example of the kind of density that exists in Dollis Hill is as follows. In 1960 there were within 180 feet of my own house 17 Blackbird nests, 15

TABLE 3—FIGURES SHOWING THE TENDENCY FOR COMMUNITIES TO CONSIST OF UNRELATED SPECIES

Author	Locality	% of genera with only one species present	Average number of species per genus
Elton (1946)	Several communities	86	1.38
Cramp (1949)	Regent's Park (1947)	87	1.18
Wallace (1961)	Regent's Park (1959)	78	1.26
Simms	Ladbroke Square (1937)	75	1.37
Simms	Dollis Hill (1951)	75	1.37
Simms	Dollis Hill (1960)	73	1.33

House Sparrow nests, four Starling nests, two Dunnock nests and one Woodpigeon nest.

Cramp (1949) and Wallace (1961), in their studies of the birds of Regent's Park, correlated their data with those of Elton (1946) who, in a wide survey of ecological communities, found a high and fairly constant percentage of genera with only one species present. Table 3 compares their figures and Elton's with mine for Ladbroke Square (1937) and Dollis Hill (1951 and 1960).

HEIGHTS OF NESTS

Records were also kept of the heights of 4,266 nests of 23 different species. This part of the survey covered all natural and man-made sites in order to find out where the altitudinal weight of the breeding population was to be found. Table 4 gives the percentage distribution of nests according to height. It will be seen that two layers—those of 5-10 and 20-25 feet—account for more than 89% of all the nests recorded. The lower layer is largely occupied by the Blackbird/Dunnock community and the higher layer by the Starling/House Sparrow one.

TABLE 4—PERCENTAGE HEIGHTS OF 4,266 NESTS OF 23 SPECIES AT DOLLIS HILL, LONDON, 1951-61

Ground	0-5 feet	5-10 feet	10-15 feet	15-20 feet	20-25 feet	Over 25 feet
0.5%	3.2%	13.6%	2.3%	3.7%	75.8%	0.9%

SONG AND DISPLAY

Full records were kept of song seasons and any displays that were seen. The paragraphs which follow summarise the more interesting aspects of these observations.

Beginning with the doves, song from the male Stock Dove often present in Gladstone Park during 1951-1956 was very infrequent, as might be expected, since there were no adjoining territories of other birds of this species. Feral Pigeons sing and display in every month of the year, and I have also heard song from Woodpigeons in every month, though it is most regular from mid-February to mid-September. The only other non-Passerine that should be mentioned here is the Tawny Owl: hooting is at its height in late September and October when territories are set up.

Great Tit song normally begins towards mid-December and early January, and lasts until July; there is then a partial resumption in early autumn. Similarly, Blue Tits often sing from December to July with a resumption in September. I have heard song from Coal Tits in

March, April and August. Wrens sing in every month of the year, but most strongly from February to July; the song gives a clear indication of the autumn spread of this species into private gardens away from the breeding territories.

Turning now to the thrushes, I have heard sub-song from Mistle Thrushes from December to March and full song from December to May. In the case of the Song Thrush, my earliest autumn date for full song is 6th October and this is then maintained through until early July; sub-song is frequent in September and October. Blackbirds may begin in December, but they normally start up in mid-February and go on until July. For three consecutive Februaries a male began his sub-song on the ground under some dense rhododendrons in my front garden; then after a day of full song in this strange location he moved up to the gutters and chimney of my house and these became his regular song-posts for the rest of the season. By making extensive tape recordings of this individual I was able to trace the development of his song. Sub-song in his third year was comparable, for example, to full song in his second year; it was not until his third season that his song assumed its fullest range, variety and beauty.

The autumn song of the Robin begins each year between 10th and 20th August. I have heard full song from Dunnocks in every month of the year; display is at its height in March and I have several spring records of the curious cloaca-pecking which was first described in 1933 by Edmund Selous.

In the case of the Starling, song is regular in every month of the year but most frequent from mid-July to early June. Indirect evidence of Continental immigration came from one which gave perfect imitations of the fluting song of the Golden Oriole in my garden in February 1952; Starlings in the area have also produced imitations of Buzzard and Little Owl which they must have heard elsewhere. In addition, I have records of Starlings mimicking the song and low alarm of a Blackbird, the song of a Song Thrush and the calls of Chaffinch, Carrion Crow, Greenfinch, Mallard and Tawny Owl. Other imitations have included the miaows of Cats, the squeals of brakes and, on one occasion, a duet with a crying baby which was so good that it was almost impossible to separate the two performers.

Turning to the finches, Greenfinch song lasts from late February to early August, while full Goldfinch song begins in mid-March and continues until mid-July. The first Chaffinches in full song can be heard each year between 6th and 17th February, with the 14th as the average. For the House Sparrow I have records of song and communal display in every month of the year, but the latter, occurring strongly in January, reaches a peak in April and then becomes less frequent each month until December.

TABLE 5—SONG POSTS USED AT DOLLIS HILL, LONDON, 1951-61

A = 100 and over c = 25 and over e = Two and over
B = 50 and over d = 10 and over i = One only

	Houses									Gardens						Streets		
	On ground	Window sills	Gutters	Stack pipes	Roof ridges and gable ends	Chimney stacks	Chimney pots	TV aerials	Factory roofs	Fences and posts	Walls	Low hedges and bushes	Tall bushes	Trees	Garden sheds	Street trees	Lamp standards	Telegraph poles
Stock Dove (*Columba oenas*)	–	–	–	–	–	–	–	–	–	–	–	–	–	c	–	–	–	–
Feral Pigeon (*C. livia*)	A	–	c	–	B	–	–	–	A	–	–	–	–	–	–	–	–	–
Woodpigeon (*C. palumbus*)	–	–	–	*e*	c	B	A	*e*	d	–	–	–	A	A	–	A	–	–
Tawny Owl (*Strix aluco*)	–	–	–	–	–	*e*	–	–	–	–	–	–	–	A	–	*e*	–	–
Great Tit (*Parus major*)	–	–	–	–	–	–	–	–	–	–	–	–	A	A	–	c	–	–
Blue Tit (*P. caeruleus*)	–	–	*e*	*e*	–	*e*	–	d	–	–	–	–	A	A	–	c	*e*	–
Wren (*Troglodytes troglodytes*)	–	–	–	–	–	–	–	–	–	d	*e*	A	B	c	*e*	–	–	–
Mistle Thrush (*Turdus viscivorus*)	–	–	–	–	*e*	*e*	–	–	–	–	–	–	–	A	–	d	–	–
Song Thrush (*T. philomelos*)	*e*	–	*e*	–	*e*	–	–	d	–	*e*	–	–	B	A	*e*	–	–	–
Blackbird (*T. merula*)	c	*e*	A	d	A	A	A	A	*e*	B	c	c	A	A	d	A	*e*	*i*
Robin (*Erithacus rubecula*)	–	–	*i*	–	–	–	–	–	–	d	–	–	A	A	*e*	*e*	–	–
Blackcap (*Sylvia atricapilla*)	–	–	–	–	–	–	–	–	–	–	–	–	c	–	–	–	–	–
Willow Warbler (*Phylloscopus trochilus*)	–	–	–	–	–	–	–	*i*	–	–	–	B	c	–	–	*e*	–	–
Chiffchaff (*Ph. collybita*)	–	–	–	–	–	–	–	–	–	–	–	B	–	–	–	–	–	–
Dunnock (*Prunella modularis*)	–	–	c	–	c	–	*e*	c	–	c	c	d	A	A	c	A	*e*	–
Pied Wagtail (*Motacilla alba*)	–	–	–	–	–	–	–	–	c	–	–	–	–	–	–	–	–	–
Starling (*Sturnus vulgaris*)	B	–	A	c	B	A	A	A	*e*	A	*e*	d	A	A	c	A	*e*	*e*
Greenfinch (*Chloris chloris*)	–	–	–	–	–	–	*e*	*i*	–	–	–	–	A	A	–	B	–	–
Goldfinch (*Carduelis carduelis*)	–	–	–	–	–	*i*	–	–	–	–	–	–	B	A	–	B	–	–
Chaffinch (*Fringilla coelebs*)	–	–	–	–	*e*	–	–	–	–	–	–	–	A	A	–	B	–	–
House Sparrow (*Passer domesticus*)	B	A	A	A	A	A	A	A	B	c	*e*	d	A	A	d	A	*e*	*e*
Tree Sparrow (*P. montanus*)	–	–	–	–	–	–	–	–	–	–	–	–	B	B	–	–	–	–

TABLE 6—NUMBERS OF OBSERVATIONS OF DIFFERENT TYPES OF TELEVISION AERIALS AS SONG POSTS, DOLLIS HILL, LONDON, 1951-61

	Dipole	Dipole bracket	H-type (upright)	H-type (cross member)	X-type (diagonal)	X-type (inter-section)	Yagi array (single upright)	Yagi array (double upright)	Yagi array (cross member)
Woodpigeon (*Columba palumbus*)	–	–	–	6	–	2	–	–	–
Blue Tit (*Parus caeruleus*)	4	3	1	–	–	–	1	1	1
Song Thrush (*Turdus philomelos*)	–	2	1	10	1	3	–	–	1
Blackbird (*T. merula*)	–	68	–	826	15	214	–	1	28
Willow Warbler (*Phylloscopus trochilus*)	–	–	–	–	–	–	–	–	1
Dunnock (*Prunella modularis*)	–	2	–	21	1	10	–	–	2
Starling (*Sturnus vulgaris*)	6	15	3	1,000+	53	183	5	94	90
Greenfinch (*Chloris chloris*)	–	–	–	–	–	–	1	–	1
House Sparrow (*Passer domesticus*)	1	186	–	1,000+	26	51	–	22	142

SONG POSTS

Very little has been published to date about the choice of song posts in built-up areas, though Fitter (1949) described Blackbirds and Song Thrushes as occasionally singing from roof-tops in London and Hulme (1955) reported eight different species using buildings as song posts in one built-up part of the Midlands; in the London area, too, the Woodpigeon has been regularly noted as using buildings for singing and displaying (Homes *et al.* 1957). At Dollis Hill the Blackbirds quite regularly, and the Song Thrushes not infrequently, use buildings as song posts and I have noted 14 other species taking advantage of some part of a permanent building (including radio and television aerials) as a point of vantage for singing. Table 5 summarises my records of song posts over a period of ten years. A bird had to sing at least one full phrase of song to qualify for inclusion.

Television aerials certainly represent ideal song posts for such species as Blackbird, Starling and House Sparrow and they are, on occasion, used by much less likely birds (Table 6). In 1951 television aerials were infrequent at Dollis Hill and it has been most interesting to trace, with the growth in their number, their increased use as vantage points for singers. (Incidentally, in 1961 I saw a Corn Bunting begin to use a television aerial on a new housing estate at Peterhead, Aberdeenshire, shortly after it was erected.) Of the nine chief perching places associated with aerials, only the Starling has so far been able to use all of them as song posts. The House Sparrow has used seven and the Blackbird six. Of course, in the London area the television aerials are normally vertically polarised.

WINTER POPULATIONS

With the coming of winter there is a change in numbers of some of the resident species, as well as the arrival of several winter visitors. Since the beginning of the present century the Mallard has increased enormously at this season in the London area. In the winter of 1951 it was not unusual to see a handful of these birds by the small lake in Gladstone Park, but there were never more than 20. By the winter of 1952 the maximum had risen to 33, by 1956 to 52, by 1957 to 67 and by 1961 to 71. It should be added, however, that this local increase can to some extent be directly correlated with the increase in human visitors feeding them. Mallard flight twice a day between the park and the Brent Reservoir and pass over my house while doing so, a habit which has enabled me to watch the steady rise in numbers throughout the decade in addition to making regular counts in the park itself. In late winter it is also interesting to watch the dispersal of Mallard into gardens and allotments, and throughout the park, in their search for

breeding sites; I have seen up to 21 birds at a time sitting in elms, oaks and plane trees in Gladstone Park in the early morning.

There is also a dispersal of some of the other breeding species into parts of the study area where they are rare or unknown in the summer. From September to February each winter up to five Great Tits will visit my garden and bird-table, and forays into other private gardens are frequent during this period. Blue Tits are also regular visitors; in December 1957 more than a dozen were present in my garden and by 3rd February 1958 the party had grown to 20. During this time increased numbers of Blue Tits were reported from Inner London—survivors of the autumn irruption of 1957—but it is interesting to note that there were no attacks on milk-bottles, paper or putty at Dollis Hill, such as those which occurred in central London, Hampstead and Balham.

Greenfinches, Goldfinches and Chaffinches come in winter to quite small gardens in search of plant seeds and there is also a dispersal of Wrens and Song Thrushes. In addition, Robins will appear in gardens to take up winter territories. A single Robin arrives in my own garden each year between 23rd July and 3rd August; it sings regularly, visits the bird-table, fights off intruders and remains until mid-March.

In winter, too, resident birds are often concentrated in areas where the cover is good. For example, in any five-minute period from dawn to dusk on 20th January 1958 there were never less than 16 individuals of four species in my own garden; at one time the number rose to 39 individuals of eight species. On 21st January 1958 there were never less than 14 House Sparrows in my garden (20 feet by 180 feet) at any one time from 8 a.m. to 4.15 p.m. and for more than twenty minutes in the afternoon there were over 200.

The six regular winter visitors to Dollis Hill are the Meadow Pipit, which at this season can be flushed from the grass in Gladstone Park or on the allotments, and five species of gull. Until the winter of 1956-57 the Black-headed Gull was the commonest of these. Even fifty years ago Kendall (1907) described it as "of frequent occurrence" and so it would seem to have been a regular winter visitor for the last half century. The Black-headed Gulls have derived benefit from the increasing number of people who feed them regularly, but they are much harassed by Common Gulls. Black-headed Gulls normally appear in numbers in the study area in late August and early September and remain until early April, but in 1952 and 1961 advance arrivals came in strength in July. I have watched as many as 70 in the air at one time, and several daily watches of 10 hours' duration each in January 1958 showed that at least one and sometimes as many as 24 were in sight from my house in every five-minute period. Black-headed Gulls also regularly use oaks, roof-tops and chimney-pots as

resting places. They cover the private gardens most diligently in their search for scraps and often assemble on the grass in Gladstone Park to hunt for worms.

The Common Gull occurs in winter on the Brent Reservoir but during 1947-52 I had only a single isolated record of one at Dollis Hill (1st November 1947). Then a few appeared in the winter of 1952-53 and by 1955-56 the number had risen to 20. These Common Gulls were shy and always obtained their food indirectly by harrying Black-headed Gulls which had picked up scraps from the ground. By 1956-57 Common Gulls outnumbered the smaller species and, besides parasitising the latter, they also obtained their own food direct. In 1960-61 it was not unusual to see up to 30 Common Gulls sitting on stag-headed oaks, roof-tops and chimney-pots. They arrive in September or October and remain until March. Since February 1958 quite large congregations have appeared temporarily on the grass in Gladstone Park, for example on 2nd February 1958 (300), 10th February 1959 (163, and on this day there were also 830 on the Brent Reservoir), 13th February 1960 (180) and 21st February 1961 (85). Sage (1960) has shown that "there must be a large influx of Common Gulls into the London Area during the period February to April to augment the winter population". Like the Herring Gull, this species has added another new habitat—that of suburban built-up areas—to those of freshwater and grassland. Its adaptation took little time and was most successfully accomplished.

Until the winter of 1957-58 the Herring Gull was a July migrant flying across the survey area. From that time small numbers (up to 14) have wintered and others have appeared in May, June and August. There have often been Herring Gulls on the Brent Reservoir, but it is only in the last three years that they have become regular visitors to the built-up area, searching for food in gardens, chicken-runs and other open spaces, and occasionally perching on roof-tops. This is certainly a movement into a new habitat. The wintering birds arrive in September and leave again in mid-March. I have several times heard their massed trumpeting displays over Dollis Hill in early March.

The Lesser Black-backed Gull is best known in the area as a late summer and autumn migrant with movements beginning in the last week of May or early June and lasting until September. Since the winter of 1957-58 a few have appeared each December and these can be seen quartering gardens until March or April. I have seen several hundreds by the Brent Reservoir between July and November, but they stay in the immediate vicinity of this piece of water. It is interesting to note that Harting (1866) described this gull as "a rare bird in Middlesex" and Kendall (1907) used the same terms for its status in north-west London at the beginning of the century. An individual

of the Scandinavian form (*L. f. fuscus*) used a flag-pole near the hospital as a perch in September 1951 and 1952.

During 1940-50 the Great Black-backed Gull increased greatly in the London area, but at Dollis Hill only rare individuals appeared in the winter months up to October 1960 when there was a definite increase. Some were then present until February 1961 and, with other species of gull, visited the chicken-runs at the top of the hill. At least four-fifths of the birds of this species have been adults.

ROOSTS

Most of the roosts in the study area are features of the winter months, but some are established or maintained during the summer as well. Feral Pigeons roost on the Post Office Research Station and one or two of the factories. Woodpigeons almost invariably choose the taller elms and London planes in Gladstone Park and here I have seen as many as a hundred. The only Tawny Owl roosting places I have found have been in elms.

The most important communal winter roosts for Song Thrushes and Blackbirds are a clump of bushes in the park and a hedge near the hospital, but I know many smaller Blackbird roosts of from three to twelve birds and these are, in fact, more typical of the district. I have found these small roosts in tall overgrown privet hedges, almonds and hawthorns. Every winter there is a small Blackbird roost of three to five birds in a tall syringa in my own garden. Dunnocks I have only found roosting in privet and snowberry hedges, from which bursts of nocturnal song are then not uncommon.

Dollis Hill lies well within the catchment zone of the central London Starling roosts. Certainly a number of birds from the area and also from the north-west as far out as Stanmore and Edgware fly into the centre of the Metropolis. For at least nineteen years one of the flight-lines has passed south-east over the Post Office Research Station and another has followed roughly the course of the Edgware Road, just inside the study area. However, some 3,500 Starlings from the latter flight-line once set up a subsidiary roost in some Lombardy poplars in the factory area, instead of going on into central London. The roost was started in August 1951 and lasted until the leaves began to fall from the trees in October of that year. It was interesting to see that a number of Starlings from the Edgware district flew steadfastly on over the new roost on their way to central London, though from time to time the whistles and chatters of the birds in the poplars below would entice a few down from the passing flocks. No other communal Starling roost has appeared in the study area, but some Starlings roost in their nesting holes during the winter months. One pair regularly spent their nights in the roof of my house, after breeding there, for

three consecutive winters. It has been suggested that it is unlikely that many adults begin to roost in their nesting holes as early as November, but my own pair came in every night summer and winter without a break; there was certainly not even any question of the male roosting elsewhere during incubation.

There are many small House Sparrow roosts in the district, chiefly in creepers on houses, and numbers may reach as high as 50. A larger roost of up to 100 occurred in hawthorns in the grounds of St. Andrew's Hospital during the winters of 1950-51 and 1951-52. During the period under review, however, the really great House Sparrow roosts have been outside the study area. The first was in some plane trees in the Edgware Road about 400 yards south of the railway line and this drew to itself the greater part of the winter population of House Sparrows in Dollis Hill. In the winters of 1957-58 to 1960-61 the roost moved to dense hawthorns by the far side of the Edgware Road near Dollis Hill Lane and only five yards outside the study area. This group of thorns also drew most of the Dollis Hill birds over a radius of just over a thousand yards. Counts showed a maximum of 750 sparrows at this roost in January and February, but smaller numbers use it in every month of the year. In the winter of 1960-61 there was an overspill across the Edgware Road into two or three thorns in some front gardens just inside the study area, but in September 1961 the whole roost moved back to its original site 400 yards outside the survey area.

A curious phenomenon is the setting up of short-term summer roosts by House Sparrows. It first came to my notice at the beginning of May 1960 when some 30-40 adults began to roost in the syringa in my garden; this lasted for just over three weeks and was used every night. The same thing happened again on the evening of 29th April 1961, with a dozen birds assembling, and lasted for a fortnight.

PASSAGE MOVEMENTS

Systematic observations have also been made of the various migrants which appear in the study area. The total of migrant species noted is 21, of which nine have been represented by only single records. The remaining 12 species have been of more or less regular occurrence. Some of the species listed previously as summer or winter visitors may also appear as migrants, especially gulls and Starlings.

The first true migrants of the year pass in February; these are night-flying Redwings (whose movements continue until the first week of April) and day-flying Rooks and Jackdaws. All the Rooks I have seen have been going east or south-east, but the Jackdaws make for points between north and east. Chaffinches in small numbers move north in the early morning in April; and Swallows and House Martins

generally appear from the first week of the month, though they do not turn up every year. An occasional Cuckoo and a regular sprinkling of Willow Warblers occur in April, but I have only one spring record of a Chiffchaff.

In late April and early May the summer population of Swifts and Spotted Flycatchers arrives. The average date for the Swift is 2nd May (though it may be as early as 25th April or as late as 6th May), while the Spotted Flycatcher returns between 6th and 10th May. In May and early June there are sometimes northerly movements of Hirundines and large influxes of Swifts. In some years Lesser Black-backed Gulls can be seen on the move in May, but their true migration normally starts in late June.

There are two species which reveal mid-summer movements. Firstly, I have records of parties of 11 Lapwings on the move on 12th July 1956, six on 24th June 1959 and four on 29th May 1960; it is possible that these originated on the Continent. Secondly, in thundery and disturbed weather in late June and July the numbers of Swifts may temporarily rise in a spectacular manner, and I have sometimes seen as many as 400 under these conditions.

July and August are usually marked by passages of Lesser Black-backed Gulls, Willow Warblers and a Cuckoo or two. The autumn movements of the Willow Warbler take place between 17th July and 29th August, often with two peaks about 6th and 25th-29th August; birds not only appear in the park, on the allotments and in the hospital grounds, but in private gardens and even in trees in the streets. The season of the Chiffchaff's autumn passage is later and lasts from 1st August to 20th September. Chiffchaffs especially favour the brambles and black currant bushes of the allotments; here one September morning there were more than 100, about ten of them being in song. Linnets and Whitethroats may also appear and the Swifts have usually left Dollis Hill by about 24th August (dates range from 15th August to 2nd September).

In September and October I have seen movements of Lapwings, Stock Doves, Woodpigeons, Rooks and Jackdaws, Pied and Grey Wagtails, Greenfinches, Siskins and Tree Sparrows. The Swallow is regular on autumn passage; movements begin about 11th September and continue into October with a peak about 20th September; my latest record is 5th October. These Swallow passages are almost invariably into the wind and the birds fly low and in a narrow line across the top of the hill. They occur most frequently from one to three hours after dawn, but in exceptional instances, for example on 20th September 1952, may last until the afternoon. The movements of the House Martin begin in late September and reach their peak in early October; on 4th October 1952 as many as 700 passed through.

All the passages of this species have been into winds of light or moderate strength.

Blackbirds can sometimes be heard calling at night as they pass over the area in October and I once saw 13 flying SW in daylight on 22nd October 1953. Most records of the Fieldfare are in October and November; typical examples are of parties flying SW (with small numbers dropping down to feed) on 9th and 11th November 1951 and groups flying NW on 16th October 1955, the latter being part of a widespread movement which was also noted in Essex, Kent and Surrey. The autumn migration of the Redwing lasts from the first week of October to the first week of November. The three heaviest Redwing nights of the many on which I carried out counts were 20th October 1952, 16th October 1955 and 17th October 1958. On the last of these I heard more than 2,000 calls between 6.30 p.m. and 11.10 p.m. and similar reports came in from Addington in Surrey and from two places within the City of London. Diurnal movements of Redwings sometimes take place in October and these can, of course, be watched. Quite heavy ones occurred on 16th October 1955, 14th October 1957 and 16th October 1960. On the last date 472 passed over between 7.45 a.m. and 11.30 a.m., all travelling between NW and north from 50 to 150 feet above the ground.

Skylark movements begin in mid-September and go on until the end of October; most of them are in directions between SW and NW and would seem to be of Continental origin. There was a considerable NW passage of these birds over Dollis Hill on 27th October 1956 and similar flights were seen that day at Staines reservoirs in Middlesex and at three places in Essex.

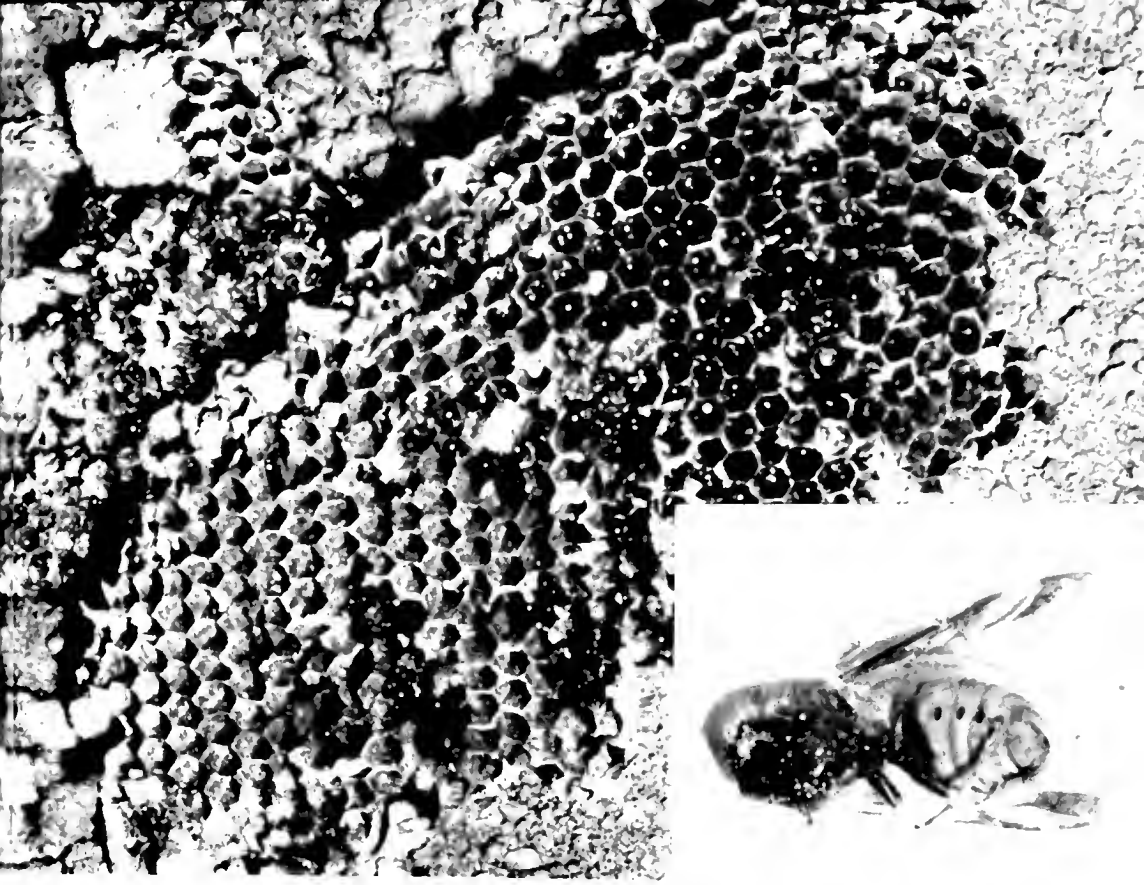
Another autumn passage migrant is the Meadow Pipit; this can be seen on the move from 14th September to 4th October, with a peak generally about 21st September. Most Meadow Pipit movements take place in the early morning and I have many records of birds passing over either singly or in flocks of from two to nine in size. 81.5% of migrating Meadow Pipits have been flying between SW and west, 11.1% between NW and north, and 7.4% between NE and SE. I have no observations of migration continuing throughout the day, as not infrequently happens along the Cotswolds in autumn.

Of the many Starlings in evidence in the autumn it is possible to separate the true migrants from the birds flying from their roosts by the times of movement. For example, on 4th November 1951 over a hundred flew SW over Dollis Hill some 1½ hours after the last ones had arrived from the central London roost. The heaviest passage I have recorded was on 16th October 1960 when 3,290 birds passed over between NW and north from 7.15 a.m. to 11.15 a.m. The peak lay between 8.0 and 8.15 a.m. when 1,100 flew over; parties varied in

PLATE 1. Aerial photograph showing Dollis Hill and the Brent Reservoir, Middlesex, 1949. The width of this reproduction covers about $1\frac{1}{2}$ miles. The limits of the area described in the paper on pages 1–36 can be seen from Fig. 1 on page 2. The allotments in Gladstone Park, now reclaimed, and those on the site of the John Kelly School are distinctly shown (*photo: Aerofilms and Aero Pictorial Ltd.*)

PLATE 2. A typical road and garden in Dollis Hill, Middlesex, illustrating the residential part of the survey area (pages 4-5). Above, a view north along Brook Road towards the Brent Reservoir, September 1960; the majority of the houses are semi-detached. Below, a front garden in Brook Road, June 1960 (*photos: B.B.C.*)

PLATE 3. Honey Buzzard (*Pernis apivorus*) standing by a hole ten inches across and 16 deep, from which it has excavated a wasps' nest, Denmark, September 1959 (page 36). This chiefly insectivorous species has small scale-like feathers on its forehead and lores, a very large cere and a tiny bill (*photo: Ivo Lysgård*)



PLATES 4 and 5. Honey Buzzard *Pernis apivorus* excavating wasps' nest, Denmark, September 1959 (page 36). Left, the ten-inch hole. Below, the bird with a piece of comb it has just dug up: a wasp is on its neck and bits of comb are lying around. Above, a section of the comb and, inset, one of the many decapitated wasps (species *Vespa vulgaris*) which were left behind by the bird (*photos by Erato-Lund*)

PLATES 6 and 7. Crested Lark *Galerida cristata* at nest, Denmark, July 1961. Both pictures show the stocky shape, the long and slightly decurved bill, the sparsely streaked upper-parts and the conspicuous upstanding crest. The short, dark-centred tail with pale (actually buff) edges can be seen on the left, and the breast markings are well illustrated above (pages 37-42) (photos: *Dr Trafford*)

PLATES 8A and 8B. Nest-box damage by Great Spotted Woodpeckers (*Dendrocopos major*), Sussex, 1961. Left, concrete box with the hole enlarged by nearly a fifth. Above, several wooden boxes with the part from hole to lid hacked out (page 43) (*photos: Guy Mountfort*)

PLATE 8C. Female Rook (*Corvus frugilegus*) with lower mandible stuck through skin of upper breast, Kent, spring 1961. It could not close its bill and both mandibles were elongated. In good condition, it may have been fed by other Rooks (page 46) (*photo: Gordon Clematson*)

size from 20 to 600. The cloud base was at 100 feet, lifting at 9.07 a.m., and there was a light breeze from NNE to NNW.

The Chaffinch is undoubtedly one of the most regular of the diurnal autumn migrants. The period of autumn passage lasts from 19th September to 27th October and in such years as 1955, 1956 and 1960 the peaks have been quite impressive. On 27th October 1956 more than 500 Chaffinches flew NW between 8.35 a.m. and 11.10 a.m., at the same time as big movements were also reported from Harold Wood and Sewardstone in Essex. On 16th October 1960 1,517 Chaffinches flew between NW and north over my house from 7.45 a.m. to 11.45 a.m.; parties varied in size from single birds up to 35 and as they passed by 50 feet or so above the ground my wife and I had no difficulty in counting them. The movement was certainly on a broad front and it was likely that more than 30,000 Chaffinches passed over the whole area that morning.

In every year there is always a certain amount of broad-front migration to be seen and sometimes, as on 16th October 1960, it may be very heavy indeed. On that day, from 7.15 a.m. to 11.45 a.m., we counted 5,889 birds of seven species flying north or north-west over Dollis Hill. These seasons of migration are always of outstanding interest and Dollis Hill can, in fact, sometimes offer examples of visible migration comparable in weight to those that occur along hill-escarpments or river-valleys. On 5th November 1961, for example, when a huge immigration of Blackbirds and Fieldfares was noted on the east coast, more than 1,000 Fieldfares flew NNW over my house between 8.10 a.m. and 3.52 p.m.

During the early years of my migration watches at Dollis Hill I was reasonably certain that all the movements I saw were on a broad front and this has been largely confirmed by parallel observations in the London area. Yet it would now seem that Swallows and House Martins in the autumn and Rooks, Jackdaws and Chaffinches in the spring use the conspicuous top of the hill as a landmark, since the parties are always seen flying over the summit and not the lower slopes. All five species travel over the highest point in a narrow stream.

SPECIES OCCASIONALLY FLYING OVER THE AREA

Apart from the Swift and Kestrel, which nest outside but near to the area, there are three species in this category—Heron, Mute Swan and Lapwing. Herons and Lapwings pass over at many different times of the year. Any Mute Swans flying over come invariably from the Brent Reservoir.

VAGRANTS AND RARE PASSAGE MIGRANTS

This group includes such species as the White-fronted Goose, Sparrow-

hawk, Hobby, Peregrine, Pheasant, Curlew, Whimbrel, Bar-tailed Godwit, Greenshank, Glaucous Gull, Turtle Dove, Little Owl, Kingfisher, Great Spotted Woodpecker, Sand Martin, Coal Tit, Redstart, Grey Wagtail, Crossbill, Yellowhammer and Serin. The Serin may have been an escape like the 12 Budgerigars, one Lovebird and one African Grey Parrot which have visited my garden over a period of ten years.

HARD-WEATHER MOVEMENTS

The coming of cold weather often brings about an increase in the numbers of some species and it is also possible to watch movements of birds across the district. A spell of severe weather may result in a temporary increase in Greenfinches, Goldfinches, tits and gulls. During the cold weather of January 1955 two Fieldfares appeared in my garden for one day; and on 20th February 1955 another, on its own and very hungry, arrived and fed for five hours on some of the apples I had put out in the snow for the Blackbirds. This individual remained until 13th March 1955; it fed and roosted in my garden and spent many hours chasing Blackbirds up to distances of 150 yards from the garden before returning to feed again. On 24th January 1958 12 Fieldfares flew SSE over my house on a day when others were recorded at Dulwich Park and Sutton in Surrey and St. James's Park in Inner London. In the cold conditions of January 1958 a party of 40 Redpolls visited my garden; this visit could not be explained by the presence of any food source and it would seem that these tired birds were temporarily attracted to the shelter of my well-developed fruit-trees.

Of visible weather movements, the most important have all been in the month of January—in 1955, 1958 and 1960. In a short cold snap in 1958 from 22nd to 27th January there were movements of Lapwings, Chaffinches, Fieldfares, Stock Doves and White-fronted Geese. More striking, however, were the events of January 1960. The weather of 10th January that year was very cold indeed and the skies were clear. At 3.25 p.m. a party of 40 Lapwings flew SSW some thirty minutes in advance of a snow-storm which soon brought visibility down to less than a hundred yards. Two days later I watched Redwings flying by day over Willesden and the B.B.C. Television Centre in Wood Lane and there were more on the following day. Then on the 14th a strong movement took place from 8.50 a.m. Redwings were passing over at the rate of 600 an hour until 1.30 p.m. and with them were scores of Fieldfares, Skylarks, Lapwings, Greenfinches and Linnets, all moving SW. This was the peak day for hard-weather movements in England and large numbers of these species were seen passing through in Sussex and Hampshire where the total

was described as "terrific". This period of cold weather may well have accounted for the presence at Dollis Hill of the Glaucous Gull I saw on 23rd January 1960.

PREDATION

Both avian and mammalian predators have some effect on the bird-life of the survey area. The mammalian predators have been introduced by man—Brown Rats (*Rattus norvegicus*) and Cats (*Felis catus*). Brown Rats have sometimes decimated the ducklings hatched on the allotments and I have also known them to take the young of Blackbirds and the eggs of Dunnocks, but their total effect is small since their numbers are severely controlled.

The Cat is by far the more important enemy of birds in the district. Fitter (1949) estimated that the total Cat population of London was of the order of 550,000. In the study area at Dollis Hill it has been impossible to arrive at an exact figure, but a wide series of sample counts in different parts in 1951 suggested that there were then about 700. By 1961 the figure had fallen to around 300 and there is little doubt that at Dollis Hill the Cat has steadily lost ground as a household pet. I know of many homes which have lost a Cat in the last decade and never replaced it. The present figure of 300 means that there is one Cat to every 12 houses; in 1951 there would have been one to every 5 houses. This decrease is not reflected in any changes in the avian breeding population, however, since the limiting factor on the total number of breeding birds is clearly the availability of nesting sites. It would seem that Cats in the area fill the ecological niche occupied in the country by Adders (*Vipera berus*) and our native carnivores and squirrels. There are, of course, no Grey Squirrels (*Sciurus carolinensis*) in the area although they occur at Hampstead and Golders Green.

I have records of Cats in the survey area taking adults of Feral Pigeon, Blue Tit, Song Thrush, Mistle Thrush, Blackbird, Starling, Chaffinch and House Sparrow—as well as the young of Mallard, Woodpigeon, Blackbird, Dunnock, Starling and House Sparrow. On occasions I have watched Cats stalking adult Dunnocks and Wrens, but timely intervention on my part has prevented these two species from being added to the list.

In connection with Cats, it is interesting to note that adult Starlings strive valiantly to encourage their newly fledged young from the lawns and flower-beds back to the safety of the gutters and roof-tops. This I have never seen House Sparrows attempt and it would seem that this is a case of adaptation in the Starling for the practice is regular in Dollis Hill but not so in country districts.

The avian predators are the Tawny Owl, the Carrion Crow and once

a Peregrine. Owls have often taken House Sparrows, and Carrion Crows have fed on the eggs and young of Blackbirds, the eggs of Woodpigeons and the young of House Sparrows. The Peregrine was a tiercel chasing Feral Pigeons around the Post Office Research Station. Since the Jays arrived in the district I have not yet seen them at work; this is also true for the occasional Sparrowhawks and Kestrels that appear from time to time.

Parasitism among birds is quite common, of course, and many species will chase and rob others of their food. The best example in Dollis Hill is that of the Common Gulls which regularly chase Black-headed Gulls, forcing them to give up their food by sheer speed and persistence of pursuit. Table 7 summarises my observations on birds chasing, attacking and robbing other species of food.

TABLE 7—FOOD-PARASITISM AMONG BIRDS AT DOLLIS HILL, LONDON, 1951-61

Parasite	Victim
Mallard (*Anas platyrhynchos*)	Feral Pigeon, Woodpigeon, Blackbird, House Sparrow
Common Gull (*Larus canus*)	Black-headed Gull
Black-headed Gull (*L. ridibundus*)	Mallard, Feral Pigeon, Woodpigeon
Woodpigeon (*Columba palumbus*)	Blackbird, House Sparrow
Blue Tit (*Parus caeruleus*)	Great Tit, House Sparrow
Fieldfare (*Turdus pilaris*)	Blackbird
Blackbird (*T. merula*)	Dunnock, House Sparrow
Robin (*Erithacus rubecula*)	Dunnock, House Sparrow
Starling (*Sturnus vulgaris*)	Blackbird, Dunnock, House Sparrow
House Sparrow (*Passer domesticus*)	Blackbird, Greenfinch, Chaffinch

THE EFFECTS OF MAN

Some human activities represent an intervention by man in favour of the birds; others may have either direct or indirect, but nevertheless adverse, effects upon bird-life. In the broadest sense, all birds which breed, roost or feed in and around buildings and gardens receive indirect but valuable benefits from man's way of life. There are, however, certain aspects in an urban area which can be studied quite closely.

Buildings provide convenient perching and resting sites, song posts and, for some species, safe places in which to nest. Poor maintenance of properties often allows birds to gain access to roofs and lofts. Starlings and House Sparrows may get in under loose tiles, under the lead covering over bay windows and through holes under the roof-ridges where mortar has become loosened or has disappeared.

There is also a superabundance of material left about by man which

birds may use in the construction of their nests. I have seen transparent cellophane wrappings from cigarette packets, sweet papers, pieces of newspaper, bits of rag and wood shavings in the nests of Starling, Blackbird and House Sparrow, while pieces of string, sometimes of phenomenal length, have been used by Starling, Mistle Thrush, Song Thrush, Blackbird and House Sparrow. There are now only a few chicken-runs in the area, but these supply feathers for Starlings and House Sparrows. I have watched a female Dunnock assiduously collecting up the white hairs blowing about on my lawn while I was still grooming my dog; and in May 1961 I saw House Sparrows performing the same function in a neighbour's garden. Once a Blue Tit spent ten minutes extracting white hairs from my dog's blanket which had been put out for brushing and airing.

With more enlightened and interested attitudes to birds there has been some increase in the provision of nest-boxes as well as an increased desire not to disturb nesting birds. There are always volunteers at hand to escort a duck Mallard and her brood across the estate and over the dangerous North Circular Road to the safety of the Brent Reservoir.

The cultivation of gardens and allotments in which the soil is regularly kept open benefits such birds as Song and Mistle Thrushes, Starlings, Robins and Dunnocks, which are primarily insect-eaters. The regular cutting of grass provides the short turf which is an important feeding area for thrushes, Starlings, Mallard, crows, pigeons, Pied Wagtails, Dunnocks, House Sparrows and gulls. Feral Pigeons and Woodpigeons regularly feed on the shoots and seeds of grasses and also take the seeds of plantains, clover and knotgrass. I have seen a Skylark in April feeding on the close-cut grass of the bowling green in Gladstone Park.

House Sparrows in the summer take many different kinds of flies, aphids, swarming ants, moths such as the Yellow Underwing (*Triphaena pronuba*), and butterflies such as the Large, Small and Green-veined Whites (*Pieris brassicae, rapae* and *napi*) and Small Tortoiseshell (*Aglais urticae*). On the other hand, House Sparrows can be very destructive and they have ripped up the flowers of yellow crocuses, wild primroses and thrift in my own garden.

Starlings in the breeding season take many insects and other invertebrates and, unlike House Sparrows, largely ignore bread at this time. On warm days in late summer it is often possible to watch scores of Starlings, often with House Sparrows, rising from roof-tops to heights of 60-150 feet to catch flies and ants; their methods are cumbersome but very successful. They also take advantage of man's planting of fruit-trees and will feed on black currants, raspberries, loganberries, plums, pears and apples. They are particularly prone to attack pear-

trees in long dry seasons, and in 1955 and 1959 stripped one in my garden of all its fruit, leaving just the cores still attached to the tree.

The reverted allotments and the more poorly tended gardens attract many birds, for here the commonest weeds are groundsel, broad-leaved plantain, chickweed, dandelion, sowthistle, creeping thistle, creeping buttercup, couch grass, white dead nettle and shepherd's purse. Goldfinches favour the seeds of thistle, groundsel, Oxford ragwort and Michaelmas daisy, Dunnocks take chickweed and plantain seeds and House Sparrows will take all.

There has been a marked increase in the deliberate feeding of birds in Dollis Hill in the last decade and, as already mentioned, the great rise in the winter population of Mallard in the district is directly due to regular feeding in Gladstone Park. It would also seem to be a contributory factor in the increased numbers of Common Gulls. The greater part of the food given to birds consists of bread and I have seen this taken by the following 20 species in the survey area: Mallard, Herring Gull, Common Gull, Black-headed Gull, Lesser Black-backed Gull, Feral Pigeon, Woodpigeon, Carrion Crow, Jay, Great Tit, Blue Tit, Song Thrush, Blackbird, Robin, Dunnock, Starling, Greenfinch, Chaffinch, House Sparrow and Tree Sparrow. I have one record of polyneuritis through Vitamin B deficiency in the Feral Pigeon. Bones and fat attract the two commoner species of tit, as well as Starlings and Robins. A single Fieldfare came to my garden, attracted by the apples I had put out for the Blackbirds in severe weather.

Man's adverse effects upon the bird-life of Dollis Hill are small in relation to the benefits. Numbers of Woodpigeons are systematically shot in Gladstone Park in winter, but apart from these control measures I personally know of only three direct actions against birds in ten years. The first was a boy who took a pot-shot at a House Sparrow with a catapult, the second was another boy who ragged a Blackbird's nest and the third was a youth who fired at a Starling in Gladstone Park with an air-pistol. Nets, muslin, black cotton, free-blowing metal strips, rotating propellers and skeletal scarecrows may be used to protect fruit-trees and bushes, peas and other crops from the depredations of birds. Allotment holders have had many occasions to complain of attacks by Woodpigeons on peas and Brassica crops.

The heavy pruning of street trees often restricts the number of breeding sites, but some species, such as the Blackbird and Woodpigeon, may take advantage of the pollarded condition of London planes. On the other hand, Woodpigeons also feed widely on the buds and flowers of elm, ash and plane, and the young leaves of ash and hawthorn, as well as on acorns and haws, and the periodic cutting of trees may reduce these sources of food. Rehabilitation of cultivated ground in Gladstone Park forced the Skylark from one breeding

ground and the building of the John Kelly Schools destroyed its last nesting site in the survey area. The felling of a small group of Lombardy poplars near my house also removed one safe breeding site for the Mistle Thrush. There has been some grubbing up of privet hedges to be replaced by walls and fences, but not yet on such a scale as materially to reduce the numbers of breeding Dunnocks. The periodic trimming of hedges causes some disturbance to breeding birds, especially Blackbirds and Dunnocks, but the latter species is surprisingly tolerant of this kind of activity provided the nest is not completely exposed to the air.

Incidentally, I have no records of birds being killed on the roads by vehicles; this must surely be due to the range of vision available to a flying bird in the Dollis Hill area, where most roads are wide and few front gardens have much high cover, as well as to the town bird habit of rising up above an approaching car and often being carried over it by the slipstream. It is the bird crossing the narrow country road with high hedges which so often dives down low above the road surface and is struck by a vehicle.

NOTES ON SELECTED SPECIES

Heron

There were two Herons on 26th July 1950 and single birds on 2nd April 1956, 18th October 1957, 26th May 1958, 28th January 1961 and 3rd April 1961. Mrs. Irene Rutherford reported to me that a Heron once dropped out of a tree in her garden in Dollis Hill Lane. Herons are not infrequent visitors to the Brent Reservoir and some must cross the area on their foraging expeditions.

White-fronted Goose

This is the grey goose most often reported in south-east England. At 11.56 a.m. on 23rd January 1958 a flock of about 40 White-fronted Geese flew over the top of Dollis Hill in a NNW direction some two hours in advance of a snow-storm. In addition, R. E. Jones reported 8 grey greese near Neasden on 4th January 1952 and I saw 16 flying NW over the area on 29th March 1958; these flocks were probably also of this species.

Sparrowhawk

Kendall (1907) recorded that the Sparrowhawk still bred in this part of London and Dixon (1909) said that it could be seen "frequently in the vicinity of Neasden and Dollis Hill". This is a lost breeding species and I have only two records of single birds on 2nd February 1953 and 9th October 1960.

Peregrine

The Peregrine is primarily a rare winter visitor. A single bird over Staples Corner on 7th January 1958 and over my garden on 8th, 20th and 22nd January 1958 was sometimes heavily mobbed by Black-headed Gulls. Others flew over my house on 13th November 1960 and 5th November 1961. There are also two late summer records of a falcon flying east on 21st July 1961 and of a tiercel chasing Feral Pigeons over the Post Office Research Station on 9th August 1961.

Kestrel

Kestrels have not bred in the area during the period of the survey. These falcons have certainly nested at Hampstead and Harrow during this time, however, and it may well be that the single birds or pairs that are seen over Dollis Hill come from one or other of these districts. Most of the records are from January to April and from July to September. Although Kestrels can occasionally be seen hovering over factory surrounds, allotments and gardens, most of them cross the area fairly quickly.

Cuckoo

Some 60 years ago the Cuckoo used to appear each summer at Kensal Rise and Kilburn, both of which are nearer to the centre of London than Dollis Hill. In the period under review, however, there have been only single birds in six of the years from 1951 to 1961. My own records include one in the grounds of St. Andrew's Hospital for the first two weeks of May 1952; one calling in Brook Road on 19th April 1953; one flying east over my house on 4th July 1958 and another on 9th August 1959; and one calling near the hospital on 6th May 1960. In *The Willesden Chronicle* of 19th May 1961 Miss E. C. Hodge reported that she heard a Cuckoo in Gladstone Park on 20th April and 13th May 1961.

Swift

The Swift is present every summer, but does not breed in the area through lack of suitable nesting sites (it will be remembered that most of the houses have been built within the last thirty years or so). Swifts certainly nest in adjacent Cricklewood and Brondesbury, however, for there are many Victorian villas there, and these birds come on daily forages over Dollis Hill. The most favoured feeding areas are the southern slopes of Gladstone Park, the top of the hill and, as one might expect, that part of the area which is closest to the Brent Reservoir; this last district is frequented by many Swifts in May and August when migration is under way.

Great Spotted Woodpecker

Great Spotted Woodpeckers were present only in 1957. There were single ones in Gladstone Park on 13th July and 24th August, and a pair in the same place on 5th August. I also saw one near the hospital on 14th August.

Jay

Before 1960 there was only one record of this species and that was of a bird found dead in a water-butt in a Brook Road garden on 2nd September 1955. On 14th September 1960, however, I discovered a live Jay in Gladstone Park; this travelled widely round the area and was joined in the early part of 1961 by a second. The pair spent much of the ensuing summer in gardens near the park, but there was no evidence of breeding.

Blackcap

Singing male Blackcaps were regularly heard in one area in 1952, 1955 and 1956; a hen was also occasionally seen, but there was no proof of breeding. A pair nested in an elder in 1958, however.

POSTSCRIPT

At the time of going to press there would seem to be some uncertainty about the future of one group of allotments and part of the special habitat area, both of which may be built over. If this happens the pattern of bird-life at Dollis Hill will be very much affected.

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SUMMARY

(1) Detailed observations were carried out on the bird life of the London suburban area of Dollis Hill from 1951 to 1961.

(2) The resulting account opens with a history of the land development from 1816.

(3) The five main habitats in the study area are then described, with summaries of the species that occur within them.

(4) It is shown that the average number of breeding species each year from 1951 to 1961 was 21; and that the total population of breeding pairs of all species in 1961 was about 1,500, a density of 52-53 birds per ten acres.

(5) The numbers of breeding pairs of each species are given, together with a description of the nesting sites.

(6) It is shown that 89% of the nests examined were in two layers, 5-10 feet and 20-25 feet above the ground.

(7) Details of song and display are given, with a description of the song-posts used by 22 species. The specialised use of television aerials as song-posts is also discussed.

(8) Winter populations, roosts, migration and hard-weather movements are described.

(9) The chief predators of birds are considered to be Cats (which have decreased in numbers during the period), Carrion Crows and Tawny Owls.

(10) The influence of man on the birds of Dollis Hill is examined: in recent years it has been almost wholly beneficial and there has been a marked increase in the number of people feeding them.

(11) Additional notes are given for ten selected species.

(12) Altogether 70 species have been recorded in the area; these are listed in broad categories in an appendix.

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APPENDIX—SPECIES RECORDED AT DOLLIS HILL, LONDON, DURING 1951-61

Birds which stay the summer

B regular breeder **O** former or occasional breeder
P non-breeder but present

Mallard (*Anas platyrhynchos*) **B**
Kestrel (*Falco tinnunculus*) **P**
Stock Dove (*Columba oenas*) **O**
Feral Pigeon (*Columba livia*) **B**
Woodpigeon (*Columbus palumbus*) **B**
Tawny Owl (*Strix aluco*) **B**
Swift (*Apus apus*) **P**
Skylark (*Alauda arvensis*) **O**
Carrion Crow (*Corvus corone*) **B**
Jay (*Garrulus glandarius*) **P**
Great Tit (*Parus major*) **B**
Blue Tit (*Parus caeruleus*) **B**
Wren (*Troglodytes troglodytes*) **B**
Mistle Thrush (*Turdus viscivorus*) **B**
Song Thrush (*Turdus philomelos*) **B**
Blackbird (*Turdus merula*) **B**
Robin (*Erithacus rubecula*) **B**
Blackcap (*Sylvia atricapilla*) **O**
Willow Warbler (*Phylloscopus trochilus*) **O**
Spotted Flycatcher (*Muscicapa striata*) **B**
Dunnock (*Prunella modularis*) **B**
Pied Wagtail (*Motacilla alba*) **B**
Starling (*Sturnus vulgaris*) **B**
Greenfinch (*Chloris chloris*) **B**
Goldfinch (*Carduelis carduelis*) **B**
Chaffinch (*Fringilla coelebs*) **B**
House Sparrow (*Passer domesticus*) **B**
Tree Sparrow (*Passer montanus*) **B**

Winter visitors and passage migrants

W winter visitor **M** passage migrant

Hobby (*Falco subbuteo*) **M**
Peregrine (*Falco peregrinus*) **M W**
Curlew (*Numenius arquata*) **M**
Whimbrel (*Numenius phaeopus*) **M**
Bar-tailed Godwit (*Limosa lapponica*) **M**
Greenshank (*Tringa nebularia*) **M**
Great Black-backed Gull (*Larus marinus*) **W**
Lesser Black-backed Gull (*Larus fuscus*) **M W**
Herring Gull (*Larus argentatus*) **M W**
Common Gull (*Larus canus*) **W**
Black-headed Gull (*Larus ridibundus*) **W**
Turtle Dove (*Streptopelia turtur*) **M**
Cuckoo (*Cuculus canorus*) **M**
Swallow (*Hirundo rustica*) **M**
House Martin (*Delichon urbica*) **M**
Sand Martin (*Riparia riparia*) **M**
Rook (*Corvus frugilegus*) **M**
Jackdaw (*Corvus monedula*) **M**
Fieldfare (*Turdus pilaris*) **M**
Redwing (*Turdus musicus*) **M**
Redstart (*Phoenicurus phoenicurus*) **M**
Whitethroat (*Sylvia communis*) **M**
Chiffchaff (*Phylloscopus collybita*) **M**
Meadow Pipit (*Anthus pratensis*) **M W**
Grey Wagtail (*Motacilla cinerea*) **M**
Siskin (*Carduelis spinus*) **M**
Linnet (*Carduelis cannabina*) **M**

Vagrants

Heron (*Ardea cinerea*)
White-fronted Goose (*Anser albifrons*)
Mute Swan (*Cygnus olor*)
Sparrowhawk (*Accipiter nisus*)
Pheasant (*Phasianus colchicus*)
Lapwing (*Vanellus vanellus*)
Glaucous Gull (*Larus hyperboreus*)
Little Owl (*Athene noctua*)
Kingfisher (*Alcedo atthis*)
Great Spotted Woodpecker (*Dendrocopos major*)
Coal Tit (*Parus ater*)
Redpoll (*Carduelis flammea*)
Serin (*Serinus canarius*)
Crossbill (*Loxia curvirostra*)
Yellowhammer (*Emberiza citrinella*)

Other birds mentioned in the text

Buzzard (*Buteo buteo*)
Partridge (*Perdix perdix*)
Corncrake (*Crex crex*)
African Grey Parrot (*Psittacus erithacus*)
Rosy-faced Lovebird (*Agapornis roseicollis*)
Budgerigar (*Melopsittacus undulatus*)
Wryneck (*Jynx torquilla*)
Golden Oriole (*Oriolus oriolus*)
Magpie (*Pica pica*)
Treecreeper (*Certhia familiaris*)
Garden Warbler (*Sylvia borin*)
Lesser Whitethroat (*Sylvia curruca*)
Bullfinch (*Pyrrhula pyrrhula*)
Corn Bunting (*Emberiza calandra*)

Observations on a Honey Buzzard digging out a wasps' nest

By Ib Trap-Lind

(Plates 3-5)

On 22nd and 23rd September 1959, I had an opportunity of watching and photographing a Honey Buzzard (*Pernis apivorus*) digging out a wasps' nest in Utterslev Mose, north of Copenhagen, Denmark. The wasps were of the common species (*Vespa vulgaris*). On my arrival the bird flew off, but it returned within a quarter of an hour and my hide did not seem to distract it at all. Altogether I watched it at work for about ten hours.

On both days it was very busy and stopped digging only for short rests or to eat the larvae it was extracting. The actual unearthing of the nest took up most of the time and it needed only a few minutes to empty each piece of comb that it brought up. Incidentally, I noticed that it did all the digging with its right foot. B. Loppenthin remarked upon the same thing in 1945 (*Dansk Orn. Foren. Tidsskr.*, 39: 187-198).

The wasps were swarming round in numbers, but they apparently did the bird no harm. They just annoyed it and it snapped at them. Afterwards, when I examined the excavation and the earth around, I discovered a lot of dead wasps and was interested to note that practically all of them were headless. It seemed likely that the bird had been eating only the larvae and pupae from the pieces of comb, and that it had decapitated the adult wasps merely to get rid of them.

Plate 3 shows the Honey Buzzard at the excavation, and in plate 5b it is actually holding a piece of comb in its beak as a wasp crawls on the side of its neck. One of the quite large pieces of comb which it was digging up can be seen in plate 5a, and the inset illustrates a decapitated wasp. When the bird had finished digging out the nest, the hole it left was about ten inches wide and sixteen inches deep; some idea of its size can be got from plate 4.

Studies of less familiar birds

116. Crested Lark

By I. J. Ferguson-Lees

Photographs by Ib Trap-Lind

(Plates 6-7)

WE HAVE ONLY two photographs of the Crested Lark (*Galerida cristata*) here, but they show the salient features very well. The species gets its name from the long upstanding crest which arises from the middle of its crown and which is conspicuous even when depressed. Many other larks have crests and inexperienced observers are sometimes misled by that on the Skylark (*Alauda arvensis*) when they see it raised and at close range, but the crest of the Crested Lark is really of almost comical proportions. The two plates also illustrate several other characters of this species and attention is drawn to these in the caption on plate 7. Crested Larks have a somewhat undulating flight, rather like that of Woodlarks (*Lullula arborea*), and a characteristic outline from their short tails and broad, rounded wings.

In Britain the Crested Lark is a surprisingly rare vagrant which has been recorded on less than fifteen occasions. The last two accepted observations were on Fair Isle in 1952 (*Brit. Birds,* 46: 211) and in Devon in 1958-59 (*Brit. Birds,* 53: 167, 422), though it should be added that the species has almost certainly also occurred in Kent on at least two occasions in the last five years. Thus, while so many other birds formerly regarded as very rare wanderers to Britain are now known to be of annual occurrence in small numbers—the Melodious Warbler (*Hippolais polyglotta*) is one such example—the enormous increase in experienced observers has failed to raise the number of records of the Crested Lark. This is all the more surprising when one remembers that it breeds in many parts of the Continent as far north as southern Norway and Sweden (though apparently not now in Finland) and is thus found on the same latitude as Scotland. It also nests in the northern half of Africa and across much of southern Asia to northern India, north China and Korea. In many places the species is resident, but Dementiev and Gladkov (1954) quoted Stanchinski (1926) in saying that it is sedentary in the U.S.S.R. only where the snow is on the ground for less than 144 days in the year, and Vaurie (1951) mentioned several published cases of migratory movements. Labitte (1957) cited two recoveries within six months of birds ringed as nestlings; in that time these had respectively travelled 1,500 kilometres SSW from Sweden into France and 750 kilometres SW from Belgium

into France. Evidence of passage has also been obtained as close to Britain as Cap Gris Nez (Redman 1956).

Many geographical forms have been separated. Dementiev (1954) mapped 37 sub-species and Meinertzhagen (1951) was able to list no fewer than 56 which were more or less generally recognised (though he himself accepted only 20 of them). Even for a bird with such a wide range across three continents, this is a very high number of distinct races. In general, populations of the Crested Lark become paler, greyer and more sandy from Europe to central Asia and then the cline is reversed; there are similar clines in wing-length and bill-length. Vaurie (1951) suggested that "its geographical variability may be due to a fairly high degree of susceptibility to varying conditions of aridity and humidity and, in some cases, to variations in the coloration of the soil." The remarkable extent to which the plumages of larks vary from sandy to brown, grey or red according to the habitat in which they are found was also discussed by Vaurie and he referred to a number of other publications on this subject; this correlation with soil colour is particularly marked in Africa. Vaurie (1959) accepted 22 races of the Crested Lark in the Palearctic, of which four are found in Europe. These are the typical *cristata*, the more faded *pallida* from Spain and Portugal, the browner *meridionalis* from the southern Balkans and Italy, and the greyer *caucasica* from Crete, Rhodes and further east.

The Crested Lark is a bird of open country, but it is much less addicted to grassland and crops than, for example, the Skylark. It prefers arid and barren ground, particularly dusty areas, desert edges, dry steppe, arable farmland, railway embankments and the edges of unmetalled roads. In some parts of its range it is found in rocky habitats in quite mountainous country, but it is generally a bird of the lowland plains. It also tends to be absent from places where there is much growth of shrubs and bushes. In central Europe, and in parts of the south, it is particularly common at the edges of villages and towns where the roads are dusty and rough. In Holland it can be seen near railway stations and demolished houses. In Poland it nests on bomb sites in the centre of Wroclaw. Dementiev and Gladkov (1954) similarly described it as much more common in the U.S.S.R. near human habitation than on the open steppe.

There are three other species of *Galerida*. Two of these, *G. deva* and *G. malabarica*, are confined to India, but in north-west, north and east Africa, and in Spain, Portugal and the very south of France, the range of the Crested Lark overlaps with that of the very similar Thekla Lark (*G. theklae*). In fact, the two species may be found closely adjacent, though the Thekla appears to be more partial to rocky or scrub-covered plateaux and slopes dotted with bushes and trees. It also seems to extend to quite high altitudes, but is perhaps most common

within a few dozen miles of the coast. Generally speaking, the Thekla is more a bird of hills, hillocks, sea-cliffs, rocks and bushes, but it also frequents sand-dunes and in the semi-deserts of the Coto Doñana in Spain it inhabits the oases near the coast as well as the scrub-covered plain inland. It may be that the presence of the Thekla causes the Crested to contract its choice of habitats, and that otherwise the latter fills the niches of both to some extent.

The situation is complicated by the fact that the two species are very similar in the field. In southern Europe, the Crested is generally more sandy than the darker and greyer Thekla, but both are so variable that much more than this is needed to separate them. It is, indeed, necessary to take into account a whole series of slight differences, hardly any of which can be regarded as reliable on their own. Niethammer (1955) also emphasised this point, but his choice of characters was misleading. He considered the most reliable features to be the Crested's larger size, its sandier colouring, the less distinct streaks on its breast and differences in habitat and voice; he also said that the Crested was much more shy. Habitat and colouring are both rather variable, however, as we have seen, and size is notoriously difficult to judge unless a direct comparison is possible; in some parts of Spain, too, Crested (and Thekla) Larks are so tame that they feed at the edge of the road while one walks by. The streakings on the breast are a very useful pointer, however. Those of the Thekla are much more distinct and the marks are quite conspicuous at, say, 30 yards when those of the Crested Lark appear as little more than smudges. The Thekla also has a smaller and more solid-looking bill, and a less melodious and varied vocabulary, but the best distinction between the two lies in the colour of the underwing. This is strikingly orange-buff in the Crested Lark and grey in the Thekla. Unfortunately, it is often difficult to see the underwing unless the observer gets the bird to fly past when he has the light behind him; however, in such conditions the wings of the Crested Lark seem to have quite a rufous glow and those of the Thekla appear silvery-grey.

The normal call of the Crested Lark is a liquid and musical whistle of four syllables (or sometimes three), written in *The Handbook* as "whee-whee-*whee*oo". This call was discussed at some length by Barrett *et al.* (1948), as a result of their observations during the war in German prison camps, the vicinities of which provided ideal habitats for these birds. They likened the rhythm of the note to "God Save the Queen". They found that it was used throughout the year, particularly in March-May and August-October, but rather less in winter. It serves to advertise territory and is also uttered in sexual chases, as well as providing contact between feeding pairs and parties. Depending on whether it is a display or contact note, it varies from

shrill and loud to soft and sweet. When uttering the shrill version, the bird stands upright with its crest raised. The normal alarm is a pure-toned whistle of two syllables, a long slow note increased in pitch at the end; this is usually delivered on the ground, the bird crouching low as it normally does before taking flight. Barrett *et al.* also described three other juvenile, pursuit and challenge calls, in addition to soft and full song.

The Handbook describes the song as "lacking continuity and vehemence of Sky-Lark, delivered more haltingly and mostly in brief phrases, produces inferior and somewhat monotonous effect", but I agree with Barrett *et al.* in considering it to be intermediate between those of the Skylark and Woodlark, and little inferior to the former, with a silvery and bell-like quality which gives it a character of its own. *The Handbook* also states that the Crested Lark sings frequently on ground, stone or building, but "less commonly on wing" and that it has no soaring song-flight like that of a Skylark. This gives a completely wrong impression, however. Barrett *et al.* considered that loud song on the ground was usually a prelude to loud song on the wing and found that song-flights commonly took place at 100-200 feet. Perhaps this song-flight gets overlooked because Crested Larks climb directly and silently, not circling and singing as Skylarks do, and similarly dive in silence back to the ground. Though they live mainly on the ground and roost there like Skylarks, Crested Larks will also perch and sing on buildings and wires, and to a lesser extent on bushes and trees. Bodenstein (1953) described an interesting wartime observation at a military hospital in Germany; the male of a pair of Crested Larks in the grounds of the hospital used to perch and apparently sing on a single barrage-balloon which was anchored there at a height of between 40 and 50 metres.

Barrett *et al.* found the Crested Larks in Germany and Poland to be regular mimics and they listed ten species which they had heard them imitate. These included Tree Sparrow (*Passer montanus*), House Sparrow (*P. domesticus*), Siskin (*Carduelis spinus*), Greenfinch (*Chloris chloris*), White Wagtail (*Motacilla alba*), Whitethroat (*Sylvia communis*), Black Redstart (*Phoenicurus ochruros*), Marsh Tit (*Parus palustris*), Great Tit (*P. major*) and Partridge (*Perdix perdix*). Similarly, Simmons (1951) noted regular imitations of Redshank (*Tringa totanus*) in Egypt, while one bird there mimicked Greenshanks (*T. nebularia*) and Green Sandpipers (*T. ochropus*) as well as responding to a human whistle. Davis (1949) reported imitations of Red-wattled Lapwings (*Lobivanellus indicus*) in Iraq.

Barrett *et al.* also described various ground displays, including courtship, territory, threat and possible nest-site selection, while Hartley (1946) gave an account of sexual displays, nests and eggs, incubation,

care of the young, injury-feigning and breeding success, from observations made in southern Palestine. More recently, Labitte (1957) described his observations on the habitat, nest-site, breeding season, nest construction and details of laying, incubation and fledging. He particularly referred to the preference which these birds showed for the vicinity of railways in his part of France, and he included a photograph of a nest built just by a railway track.

Nests, which are built by both sexes, are usually on the ground or under banks, but they have been found on the turf roofs of rough sheds. They are usually sited by some clump of vegetation—a small shrub, a large thistle, a potato plant or a thick tuft of grass—and are generally rather loosely constructed cups of grass. They are usually very simple and may or may not be lined with fine roots or hair, though Chappell (1946) described nests in Palestine as "beautifully woven and cup-shaped"; eleven nests that he found were all built under clumps of vegetation and faced north or north-east away from the sun. Clancey (1944) discovered a number of nests under shrubs in Italy, which were "composed of coarse heathland grasses, lined with fine rootlets. Each nest was neatly domed with similar material, the superstructure being roughly woven and incorporating a number of the lower, and generally dead branches of the shrub. The dome was always so constructed as to give the nestlings the maximum protection from the fierce solar rays."

Fresh eggs may be found from late March to mid-July in Eure-et-Loir in northern France and three broods are often reared (Labitte). There are usually four eggs in the clutch in Europe, though sometimes five and occasionally three or six, while fives and sixes are evidently more regular in Palestine and north Africa; one female in northern France, which laid and lost five clutches between mid-April and mid-July, still produced four eggs each time and it was estimated that as high a proportion as 90-95% of the clutches in that region were of this size (Labitte). Parasitisation by the Cuckoo (*Cuculus canorus*) was recorded by Briché (1956). Incubation begins with the last egg (Hartley, Labitte) and is by the female alone. Hartley gave details of the lengths of time for which one individual bird covered the eggs and he found the total incubation period to be 11-12 days (which is shorter than the 12-13 days given in *The Handbook*). He also noted that the shells of hatched eggs were either eaten by the female or dropped a foot or two from the nest as soon as the chick had emerged. The young are fed by both parents and they leave the nest a week or more before they are able to fly; those in the three nests watched to this stage by Hartley left at between eight and 11 days old. The young are fed chiefly on insects, especially caterpillars and small grasshoppers, and various other invertebrates are taken in the breeding

season. Otherwise, however, this species seems to feed mainly on grain and the seeds of grasses, and it is one of several birds which are known to peck grain from horse and cattle droppings in winter.

I am most grateful to D. I. M. Wallace for allowing me to include his notes on the separation of Thekla and Crested Larks with mine.

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Notes

Golden Eagle attacking Reindeer.—With reference to the recent papers by Dr. K. Curry-Lindahl and Dr. G. Bergman on the food and feeding habits of birds of prey in Fenno-Scandia (*Brit. Birds,* 54: 297-306, 307-320), it may be of interest to record an attack by a juvenile Golden Eagle (*Aquila chrysaëtos*) on a female Reindeer (*Rangifer tarandus*) and her half-grown calf, which we witnessed at Olderfjord, Troms, Norway, on 11th August 1961. The Golden Eagle was first seen circling above a mountain. Suddenly, with feet and talons extended, it swooped towards the two Reindeer which cowered in the face of the attack. The female Reindeer was sheltering the calf, but the Golden Eagle repeatedly tried to press home its attacks and the swoops it was making missed her only by a matter of inches because she was ducking down at the last moment. Altogether the Golden Eagle dived about six times before the two Reindeer were able to retreat

under a large boulder. They were not seen to reappear even when the bird moved away. M. P. HARRIS and R. PRICE

Kingfisher ducking Kingfisher.—On 4th August 1961, as I was driving alongside the River Bourne at Idmiston, Wiltshire, my eye was caught by what I took to be a fish jumping. The stream was only some six inches deep at that time and about ten feet wide. I drew to a halt and looked through my binoculars at the object which was still bobbing up and down in the water. To my surprise I found that I was watching a fight between two Kingfishers (*Alcedo atthis*). One was hovering low over the water and apparently holding the other by the bill. It was repeatedly ducking the latter and I had the impression that there was a small fish somewhere between the two beaks. Unfortunately, however, the squabble came to an abrupt end almost as soon as I focused my binoculars and the two contestants flew off rapidly into the surrounding bushes. The whole incident was observed for about 25 seconds, during which time the lower bird was being pushed under at least once per second, and it should be remembered that I did not see the beginning.

As a sequel to this observation, I erected a mist-net near the spot on 9th September and, almost at once, two Kingfishers hit it in rapid succession. One immediately began to duck the other even while they were entangled in the net and this continued until my companion, F. P. Errington, started to take them out. The one which was being attacked proved to be in first-winter plumage. Unfortunately, the aggressor escaped while being extracted from the net.

G. H. FORSTER

Further notes on Great Spotted Woodpeckers attacking nest-boxes.—I have previously drawn attention (*Brit. Birds,* 52: 270, 54: 119) to the damage done to nest-boxes at Possingworth, Sussex, by Great Spotted Woodpeckers (*Dendrocopos major*). During the winter of 1960/61 further damage was caused to ten more boxes, and between 1st March and 30th June 1961 another twenty-four received sufficiently severe attacks to necessitate the complete replacement of the fronts. Seventeen of these contained nests of Great Tits (*Parus major*) or Blue Tits (*P. caeruleus*) at the time. One clutch of eight eggs of Great Tits was pulled out with most of the nest. Nestlings killed totalled nine Great Tits and at least one hundred and four Blue Tits (exact brood sizes were not known in one or two instances). In nearly all cases the nestlings were removed and presumably eaten, but a few dead ones were found in the nest remains. In only one instance did a brood survive after a box had been sufficiently opened-up to permit a woodpecker to enter, presumably because the bird had been

disturbed before completing its task. Eight other occupied boxes received less severe damage; in some of these eggs or young were deserted, though it cannot be proved that the attacks caused the desertions. Nearly one third of the 190 nest-boxes in the park have now received some damage from woodpeckers and several have had fronts replaced more than once. So far as I can ascertain, there are not more than four pairs of Great Spotted Woodpeckers in the 150 acres where these attacks occur. Nestling tits therefore appear to have become an established part of the diet of these birds in spring.

There is evidence of improved technique in gaining access to the nests, by comparison with previous years. In 1959 and 1960 the entrance holes of damaged boxes was merely evenly enlarged and in one instance a hole was made in the side of a box. In 1961 nine-tenths of the damaged boxes showed that the woodpeckers had worked only on the two inches between the top of the entrance hole and the lid. This section was speedily knocked in to the width of the hole and then widened to permit the bird to enter. The wood is three-quarters of an inch thick, with two coats of preservative. Several boxes so damaged are shown on plate 8b.

The previously reported attempts by woodpeckers to open my concrete nest-boxes have continued and plate 8a is an illustration, but so far damage is only slight. An interesting variation, however, was an attack last winter on an open-fronted concrete box designed for Spotted Flycatchers (*Muscicapa striata*); not only the edges of the open part of this box but also the entire roof were pitted, the marks being identical with those around the entrance hole on an adjacent concrete tit-box.

GUY MOUNTFORT

Calandra Lark in Dorset.—A Calandra Lark (*Melanocorypha calandra*) was under observation at Portland Bill, Dorset, for much of 2nd April 1961. I first heard it calling at 11.30 G.M.T., and then saw it circling overhead with Skylarks (*Alauda arvensis*). Its large size and dark underwing, combined with an absence of any pale wing-patch, confirmed its identification. R. J. Jackson soon joined me and we were able to obtain good views of the bird in flight and on the ground. During the course of the day it was seen by at least 23 observers, and the following description is culled from detailed notes made by F. M. Gauntlett, R. J. Jackson, Dr. K. B. Rooke, M. Terry and myself:

Size and build: when flying looked twice as big as Skylark, partly due to large expanse of open wing, and on ground approximately corresponded to Song Thrush (*Turdus philomelos*) with which it was directly compared; bulky, and plump like Corn Bunting (*Emberiza calandra*), usually with short-necked appearance. *Upper-parts:* crown dark with some streaking; nape pale grey with no obvious streaking; mantle dark greyish-brown streaked with darker brown or blackish, as in juvenile Mistle Thrush (*T. viscivorus*) (i.e. feathers had dark

brown centres with pale grey fringes), and lacking brownish-buff or olive-buff tinge of Skylark; rump warmer and more buff than mantle, with fewer streaks. *Sides of head:* grey-brown with pale off-white or greyish-white supercilium starting a little in front of eye and travelling round behind ear-coverts (not broad, but quite conspicuous at a distance, even in flight); darker line through eye angled back at posterior edge of ear-coverts. *Under-parts:* throat off-white; very conspicuous and almost horizontal patch of dark blackish on each side of neck, about 2½ times as long as broad, sometimes looking blunt-ended and sometimes more pointed at centre of upper breast where the two patches almost met; shadowy area between these and a few distinct spots of brownish below; remainder of under-parts whitish and unstreaked; under tail-coverts pure white. *Wings and tail:* wings generally dark with two lines of pale buffish tips to coverts forming indistinct bars, and one line of dark centres (to the median coverts?) producing dark bar in front of these, as in Tawny Pipit (*Anthus campestris*); in flight there was marked contrast between remiges and rest of upper surface of open wing, as in Kestrel (*Falco tinnunculus*) and Turtle Dove (*Streptopelia turtur*); underwing blackish with prominent white trailing edge, this white being most conspicuous near body but probably extending as far as inner primaries; tail very short and dark brown with whitish outer feathers. *Soft parts:* bill pale horn or pale yellow with darker tip, short and heavy and reminiscent of finch or Corn Bunting (bill and facial pattern together distinctly bunting-like); gape pale orange; eye dark; estimates of leg colour varied from pink (in strong sun), salmon-pink, flesh-pink and bright flesh to light pinkish-straw and yellowish-orange.

When first seen the bird was calling with a succession of loud notes which I rendered as *prrrruuup*, but which were impossible to describe adequately. After circling for four or five minutes at a height of 50 or 60 feet, it dropped like a stone, uttering a rather long *trrrreeeep*, and alighted about 20 yards away in one of two small adjoining fields which had recently been drilled. Here it spent most of the rest of the day. It was not heard to call any more and, in general, seemed rather shy and nervous, often flying off and climbing high in a vigorous manner; after circling in typical lark-like flight, it would then plunge steeply with nearly closed wings down almost to ground level, finally planing to earth on outstretched wings. It would crouch for long periods in hollows and often stood still, sometimes on a small ridge or stone, apparently doing nothing. When alarmed it would stand upright with outstretched neck, and it sometimes flew with its neck extended. It hopped, walked and ran. It could usually be picked up fairly readily against the rather dark soil. At times it looked a very grey bird compared with Skylarks; this was very marked in the overcast light of evening when the head especially seemed grey and the streaking on the mantle appeared as black striations. It left with some Skylarks at dusk and was not seen again.

To sum up the salient features, this was a large lark with a very short tail and broad, rounded wings, the undersides of which were black with white trailing edges; it had mainly unstreaked and almost white under-parts with conspicuous blackish neck patches; it had greyish-

brown upper-parts, a bunting-like bill, white outer tail-feathers and no crest. If one accepts the decision of the editors of *British Birds* to exclude the "Hastings records" (see P. A. D. Hollom, *The Popular Handbook of Rarer British Birds,* 1960, p. vi), this is the first known occurrence of this species in Britain. J. S. Ash

Rook with unusual bill deformity.—On 26th February 1961, Mr. Gordon Finn-Kelcey telephoned me to say that a Rook (*Corvus frugilegus*) had been shot on his farm at Old Romney, Kent, because it had a beak so misshapen that it could not possibly feed itself. I inspected the bird later the same day. Both mandibles were very elongated. The upper one was much decurved, while the lower, correspondingly upturned, was embedded through its middle length in the flesh and feathers of the upper breast. The body was plump and well-nourished and we concluded that the bird must have been regularly fed by other Rooks. From the way the lower mandible entered and emerged from the flesh, we thought that the lengthening of the mandibles must have been a consequence of the piercing of the upper breast and in no way a cause of it. Presumably the two mandibles started to grow in length as soon as the bird was unable to close them properly. On 2nd March Mr. Gordon Clemetson took the photograph which is reproduced here as plate 8c.

I arranged for the body to be sent to Dr. James M. Harrison who managed to salvage the specimen although it was by then in a very decomposed state. He found that the bird was an adult female and he likewise commented on the fact that it was not nearly as emaciated as might have been expected, although "feeding must have presented many difficulties". He measured both mandibles from the gape. The upper was 66 mm. and the lower 71 mm. (*The Handbook* gives the measurements of the bills of ten adult females as 31-38 mm. from the nostril). He added that "approximation of the two mandibles fails by 2 mm. at about 34 mm. from the gape". W. S. Nevin

Recent reports and news

By I. J. Ferguson-Lees and Kenneth Williamson

[These are largely unchecked reports, not authenticated records]

Our last summary reviewed the occurrences of unusual Passerines and of all American species from early August to November, against a background of the more striking movements of common land birds. The following gives a brief picture of other groups during this same three-month period and is chiefly concerned with the rarities.

BIRDS OF PREY

A **Red-footed Falcon** (*Falco vespertinus*) was seen near Zennor (Cornwall) on 17th September and one was found dead at Hule Moss, Greenlaw (Berwickshire) on 15th October. Other unusual birds of prey included **Kites** (*Milvus milvus*) at Sandwich Bay (Kent) and Minsmere (Suffolk) on 26th and 28th November respectively. **Ospreys** (*Pandion haliaëtus*) were reported up to 19th November, in various parts of the country from Aberdeen, Northumberland and Yorkshire to Suffolk and Kent, and on the south coast from Sussex to Devon. There were a few reports of **Rough-legged Buzzards** (*Buteo lagopus*) on the east coast down to Suffolk and across to Perthshire and Cheshire, but nothing like the number in 1960.

DUCKS, GEESE AND SWANS

Red-crested Pochards (*Netta rufina*) were reported from August to November in Kent, Essex, Hertford, Wiltshire, Leicester and Nottingham, and **Ferruginous Ducks** (*Aythya nyroca*) from September to November in Kent, Stafford, Worcester and Lancashire. A **Snow Goose** (*Anser caerulescens*) appeared on the River Lune, some miles north-east of Lancaster, on 17th September and stayed for some weeks. Meanwhile, another flew over Gladhouse Reservoir (Midlothian) and what was thought to be the same bird arrived on the Dumfries side of the Solway Firth later the same day. A blue phase Lesser Snow or "Blue Goose" (*A. c. caerulescens*) came to Libberton (Lanarkshire) on 13th October and now seems to be wintering there for the third successive year (*cf. Brit. Birds,* 54: 182). Another "Blue Goose" was identified in Cheshire in October, but this is more likely to have been a hybrid. **Bewick's Swans** (*Cygnus columbianus bewickii*) began to arrive in East Anglia about 29th October, when a party of five also appeared in Somerset, and during the next three weeks there were single birds or parties of up to 45 in Essex, Suffolk, Norfolk, Lincoln, York, Derby, Huntingdon, Middlesex and the Isle of Man.

WADERS

The early wader movements were discussed in our August summary (*Brit. Birds,* 54: 333). **Little Stints** (*Calidris minuta*) remained fairly numerous throughout the autumn, but the unusual quantities of adult **Curlew Sandpipers** (*C. testacea*) in late July and early August were followed by a rather below average passage of birds of the year. **Grey** and, to a lesser extent, **Red-necked Phalaropes** (*Phalaropus fulicarius* and *lobatus*) began to appear in the second half of August when there were odd ones in Yorkshire, Norfolk, Suffolk and Caernarvonshire, and rather more in western and southern Ireland. Totals of over 40 and over 150 phalaropes were counted off Cape Clear (Co. Cork) on 25th and 27th August. In September there were small parties in Scilly, Cornwall, Devon, Dorset, Anglesey, Co. Antrim, Northampton, Nottingham and Yorkshire, and several quite sizeable groups of up to 55 off Erris Head (Co. Mayo). In October there were gatherings of up to 20 or so in Scilly and Cornish waters and odd ones to almost the end of the month in Dorset, Kent, Norfolk, Lincoln, Nottingham, Stafford and Cheshire. The latest report was of one at Spurn (Yorkshire) on 15th November. The autumn total was of the order of four or five hundred, but this is nothing compared with the several thousands involved in 1960 (*Brit. Birds,* 53: 529-531).

Apart from the American waders mentioned last month, several other rare species were represented. A **Sharp-tailed Sandpiper** (*Calidris acuminata*) was identified at Burton Marsh (Cheshire) during 1st-3rd September and another, an adult in almost full summer plumage, stayed at Bedford sewage farm from 4th to 11th September. A **Terek Sandpiper** (*Tringa terek*) appeared at Blagdon Reservoir (Somerset) on 6th October, and a **Sociable Plover** (*Chettusia gregaria*)—the second in 1961—was seen at Wilstone Reservoir, Tring (Hertfordshire), on the 29th. **Broad-billed Sandpipers** (*Limicola falcinellus*) in Co. Durham and Nottinghamshire

have already been mentioned (*Brit. Birds,* 54: 333) and there was a third near Newcastle-on-Tyne, at Seaton Burn, from 12th to 16th August.

GULLS AND TERNS

The most unusual record in this group concerned an **Ivory Gull** (*Pagophila eburnea*) at Porto Bello, Brighton (Sussex), on 19th November. Three of the half dozen reports of **Sabine's Gulls** (*Xema sabini*) came from Cornwall—single adults at St. Ives on 19th and 22nd August and at Sennen on 19th September. The others were an adult at Spurn (Yorkshire) on 11th September, one at Portland (Dorset) on the 19th and two juveniles on Rathlin Island (Co. Antrim) on the 29th. The number of reports of **Mediterranean Black-headed Gulls** (*Larus melanocephalus*) on the south coast from August to October, and to a lesser extent in November, was remarkable. During this time there were at least two in Kent, some six in Sussex, one in Hampshire and two in Dorset, and regular observations of a number of different individuals in Cornwall, particularly at St. Ives, from 31st July to 20th October. There was also one at Spurn (Yorkshire) on 21st October and, of course, the "regular" at Hartlepool (Co. Durham). **Little Gulls** (*L. minutus*) continued to increase. Apart from those on the east coasts of Scotland and England, there was again a spectacular passage of them at Portland Bill from late September to early November, with peaks of 69 and 78 on 14th and 20th October. As many as 33 were also seen on the Exe Estuary (Devon) on 8th October, and there were several other records as far west as Cornwall, Flint and Cheshire, as well as odd ones in inland counties.

Reports of **Gull-billed Terns** (*Gelochelidon nilotica*) were rather few—at Portland (Dorset) and Dungeness (Kent) on 21st and 24th August. A **Sooty Tern** (*Sterna fuscata*), an immature bird, was identified at the mouth of the River Exe (Devon) on 12th September.

OTHER WATER BIRDS

The **Little Egret** (*Egretta garzetta*) in Anglesey in August (*Brit. Birds,* 54: 334) moved to Malltraeth on 2nd September and was still there on 3rd December. Further **Purple Herons** (*Ardea purpurea*) included a young bird at Snargate (Kent) on 9th August and another which stayed at Shotton Pools (Flintshire) from 24th September to 12th October and then reappeared there from 19th to 22nd November. A **Little Bittern** (*Ixobrychus minutus*) was picked up dead at Weybridge (Surrey) on 22nd August. **Spoonbills** (*Platalea leucorodia*) were reported throughout the autumn from Norfolk to Kent and in Devon and Cornwall. The largest numbers were nine and six at Dungeness (Kent) on 29th and 30th August and the latest was at Abberton (Essex) on 3rd November. Four **Cranes** (*Megalornis grus*) were identified in flight not far from Southport (Lancashire) on 11th November. What seems to have been a **Little Crake** (*Porzana parva*) was seen at Chew Valley Reservoir (Somerset) on 5th November, and there were a dozen reports of **Spotted Crakes** (*P. porzana*) from August to October in places as far apart as Shetland, Cheshire, Flint and Kent.

Black Guillemots (*Cepphus grylle*) are not often recorded far south of their breeding range, so that one in Kent and a series of observations from Sussex are of no little interest. The first to be reported were off Selsey Bill (Sussex) and Dungeness (Kent) on 11th and 12th August respectively. There were then further observations at Selsey on 3rd and 16th September and 1st October; the state of moult showed that the two September birds must have been different individuals. After some early records of **Little Auks** (*Plautus alle*) in September—including ones in summer plumage at Holy Island (Northumberland) and Great Saltee (Co. Wexford) on the 7th—there was a small influx on the east and south coasts from Northumberland to Dorset, and to a lesser extent elsewhere, between 11th October and 19th November. One was picked up exhausted near Salisbury (Wiltshire) on 6th November.

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3. Certain conventions of style and layout are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing systematic lists, reference lists, tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in January 1953 (46: 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Subspecific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1962" and no other, except in tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the layout of the table concerned. It is particularly requested that authors should pay attention to reference lists, which otherwise cause much unnecessary work. These should take the following form:

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WITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits*. London. p. 34.

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4. Tables should be numbered with arabic numerals, and the title typed above in the style used in this issue. The title and any headings within the table should not be underlined, because this sometimes makes it difficult for the editor to indicate the type to be used. It is most important that the layout of each table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that tables must either fit into the width of a page, or be designed to fit a whole page lengthways. All tables should be self-explanatory.

5. Figures should be numbered with arabic numerals, and the captions typed on a separate sheet. All line-drawings should be in indian ink on good quality drawing paper (not of an absorbent nature) or, where necessary, on graph paper, but this must be light blue or very pale grey. It is best if maps, graphs, etc., are drawn twice the size of the final reproduction (ideally, therefore, for the normal 4″ width the original should be 8″ wide); sketches of birds, however, should be only slightly larger than the size at which it is intended they should appear. It is always most important to consider how each drawing will fit into the page. The neat insertion of lettering, numbers, arrows, etc., is perhaps the most difficult part of indian ink drawing and, unless he has had considerable experience of this kind of work, an author should seek the aid of a skilled draughtsman.

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Birds with abnormal bills

By D. E. Pomeroy

(Plate 9)

INTRODUCTION

CLOSE CORRELATION of the shape and size of a bird's bill with its feeding preferences has been demonstrated even within a species (see Lack 1947, Snow 1954). But individuals with bills differing considerably from the normal also occur, even though rarely, and prompt certain questions. How do these abnormalities arise? Do they survive and, if so, how in view of their marked divergence from the type produced by selection? Many birds with abnormal bills are unable to feed in the usual way and, at least in some cases, they acquire feeding mechanisms appropriate to the beaks which they possess. Thus it may be that, in normal birds too, the feeding mechanisms which are seen are acquired as a result of having a particular type of bill; and the fact that normal members of a species show a "lack of individual variation in the motor pattern can . . . be ascribed in part to lack of variation in the relevant effectors" (i.e. bills) (Hinde 1959).

It was shown by Spalding, as long ago as 1873, that the motor patterns of a chick in pecking at small objects are well organised at the first peck; but later work has revealed that these patterns are improved with practice (Koenig 1951). Thus a learning process is involved. It has only recently been accepted (e.g. Hinde 1959) that birds' behaviour does show plasticity; in other words, it is less stereotyped than was once thought. The adaptability now suggested enables birds to survive even with abnormal bills. It also makes

PLATE 9 (*opposite*). Upper, juvenile male Hawfinch (*Coccothraustes coccothraustes*) with incomplete bill, Switzerland, August 1949. Although its two mandibles met only at the base, an apparently congenital deformity, its weight was normal and it covered 460 km. in 43 days (page 65) (*photo: Willy Pfeiffer*). Lower, adult male Starling (*Sturnus vulgaris*) with elongated and down-curved bill 42 mm. long; this symmetrical deformity is not uncommon among Starlings, lengths up to as much as 2½ inches (over 60 mm.) having been recorded (page 57) (*photo: Eric Hosking*)

possible the acquisition of different feeding mechanisms within a species, which may be of importance in enabling birds to take advantage of locally abundant food supplies. Hence, plasticity in feeding mechanisms may have a positive evolutionary value—unlike, for instance, reproductive mechanisms, where selective pressures will tend to favour uniformity within the species.

Thorpe (1956a and b) has shown that individual Passerines may acquire unusual feeding methods; these are more easily acquired by some species than others. There is some evidence that the ability to acquire new feeding mechanisms also varies from species to species: examples will be given in which the behaviour varies considerably from the normal. The Starling (*Sturnus vulgaris*) shows considerable adaptability, but this may be correlated with the wide range of foods taken by normal members of this species.

Deformities may develop slowly—over a period of a year or more in some cases—or rapidly, as the result of an accident. Clearly the latter type requires much greater plasticity of behaviour if the bird is to survive, and this must be taken into account in the interpretation of differences in behaviour. The number of deformities due to injury is rare, however, and when behaviour is mentioned it may be assumed that the abnormality was not the result of a sudden injury unless otherwise stated.

The information in this paper is derived mainly from the results of an enquiry published in four ornithological and agricultural journals, from published records, and from correspondence. Full acknowledgements are given at the end or in the body of the text.

THE NORMAL BILL*

The underlying bony structure of the normal bill is shown in Fig. 1. This differs considerably in shape in different species, but the basic structure does not vary. Immediately overlying the bones is a cutaneous layer, or dermotheca, which is continuous with the skin or epidermis over other parts of the bird. The dermotheca is thin, and contains blood vessels and nerves. From it arises the horny sheath, or rhamphotheca, which forms the externally visible part of the bill. The rhamphotheca is produced from proliferating cells in the dermotheca which, as they divide, move outwards, at the same time becoming keratinised and, therefore, hard (Rawles 1960). The rhamphotheca may form a continuous sheath, as in most birds, or be made up of a number of separate plates, as in the Procellariiformes and some other groups. There are also differences in the degree of hardness found in the rhamphotheca: in a few species (e.g. some parrots)

*The author is very grateful to Sir A. Landsborough Thomson for help with the information contained in this section.

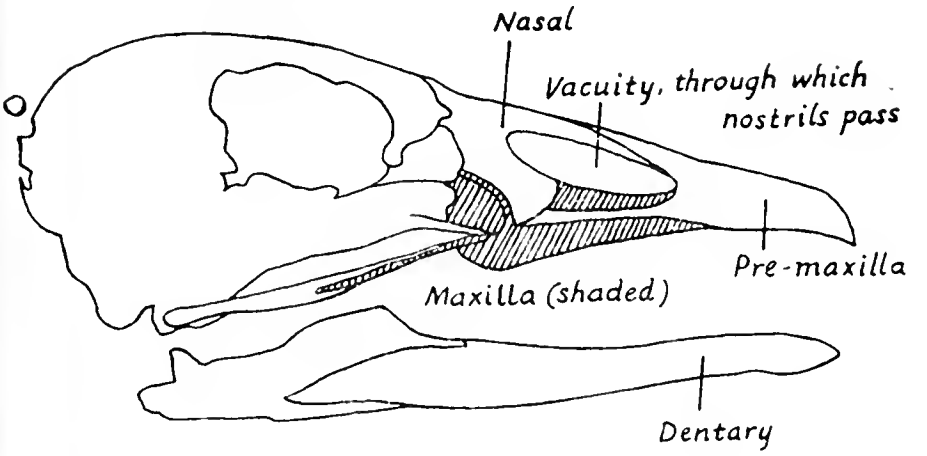


FIG. 1. The bones of a bird's bill (after Young 1950)

the cere appears to be ordinary skin, and may even bear feathers. In the Puffin (*Fratercula arctica*) the outer part of the rhamphotheca is grown and shed seasonally.

As far as is known, the bill grows throughout life (Rawles 1960), although the rate at which this occurs must vary from species to species. Moreover, there appears to be some individual variation within the species. Fox (1952), Moltoni (1949, 1950) and others have suggested that in most birds the growth of the bill is opposed by wear and tear, and by the opposition of the mandibles to each other; provided that both processes occur at an equal rate, the correct form of the bill will be maintained. This mechanism appears to explain some of the commoner abnormalities which occur (see later).

However, it should be mentioned that in some species the ends of the mandibles (where most growth occurs) are never opposed to each other. This happens in the majority of birds of prey and in all psittacine birds, as well as a few members of other groups, e.g. the adult Scissor-bill (*Rynchops flavirostris*).

It is well known that the range of bill types found amongst the ten thousand or so living species of birds is considerable. However, as will be seen, the range found in abnormal bills is even more remarkable. Various attempts have been made to classify normal bill types, perhaps the most satisfactory being that given by Van Tyne and Berger (1959).

Finally, it should be mentioned that variation of bill, other than that dependent on age, can occur within the species. The seasonal dimorphism of the Puffin has been mentioned; in the New Zealand wattle-birds (*Neomorpha*) there is a sexual dimorphism (the bill of the male being longer and more decurved than that of the female). Colour differences also occur, e.g. seasonal changes and sexual differences in the Starling and Blackbird (*Turdus merula*).

TABLE 1—VARIATION IN THE DIRECTION OF THE CROSSING OF THE MANDIBLES OF THE CROSSBILL (*Loxia curvirostra*)

Country	Lower mandible crossed left	crossed right	% left	% right
France (Mercier and Poisson 1924)	10 (7♂ 3♀)	5 (3♂ 2♀)	67	33
Norway (P. P. G. Bateson *in litt.*)	34 (18♂ 16♀)	25 (14♂ 11♀)	58	42
	44	30	59	41

The bill of the Crossbill

Only two genera of birds normally have crossed bills—the crossbills of Eurasia and North America and the *Loxops* of Hawaii (Landaeur 1938). In the young Crossbill (*Loxia curvirostra*) the tips of the mandibles are coincident (Witherby *et al.* 1941), and in the adult the direction of crossing varies. This is illustrated in Table 1 (see also Ludwig 1932); the apparent preponderance of those with the lower mandible going to the left (59% of the total) might well disappear if a larger sample were available. The fact that the ratio is similar in both sexes shows that the direction of cross is not a sex-linked character.

OCCURRENCE OF ABNORMALITIES

An abnormality may be defined as any irregularity in the bird's bill which is sufficiently different from the normal to attract the observer's attention. Such abnormalities are those which are likely to affect the bird in some way. Birds with abnormal bills are rare in the wild state (see Table 2). This could be due either to a low incidence of the causes of abnormality, or to a low survival of birds with abnormal bills.

Deformities that are not the result of injury have been recorded in about sixty species of wild birds, but their actual occurrence is doubtless much wider. There are, of course, more records for those species which are more readily observed, e.g. the House Sparrow (*Passer domesticus*), or trapped and handled in large numbers, e.g. the Starling. It is tempting to suggest that deformities occur more frequently in some species or families than others, but this would be very difficult to prove and, on the whole, there is little evidence to support it, except possibly in the case of the Starling. Over sixty cases have been recorded in this species—the next largest number in any one species being fifteen. Nevertheless, Table 2 (which contains all the available information) suggests that the occurrence is not significantly higher in the Starling than in other species. With regard to frequency of deformity, then, all that can be said is that it is well below 1% in wild birds. In cage birds, however, deformities appear to be much more frequent—although no accurate quantitative information is available.

This information is mainly derived from ringing records supplied to the author by the people named, it being likely that any bird with an abnormal bill will be noticed as it is being handled. Samples of less than 100 individuals have been excluded. Note that none of the records of deformities in this table refers to non-Passerines (although there were two in the small samples omitted). This could mean that Passerines with abnormal bills adapt their behaviour more readily than many non-Passerines, thus being more likely to survive and be recorded

Species	Locality	Size of sample	Deformities No.	Deformities %
Manx Shearwater (*Procellaria puffinus*)	Irish Sea area (H. Dickinson)	3,000+	0*	0.0
Pheasant (*Phasianus colchicus*)	England (I. F. Keymer)	325	0	0.0
Herring Gull (*Larus argentatus*)	South Wales (H. Dickinson)	200+	0	0.0
Razorbill (*Alca torda*)	Skokholm (H. Dickinson)	*c.* 100	0	0.0
Puffin (*Fratercula arctica*)	Skokholm and Great Saltee (H. Dickinson)	1,250+	0	0.0
Wood Pigeon (*Columba palumbus*)	England (I. F. Keymer)	129	0	0.0
	Non-Passerine total	*c.* 5,004	0	0.0
Great Tit (*Parus major*)	Cheshire (W. T. C. Rankin)	130	1	0.77
Blue Tit (*Parus caeruleus*)	South Wales (H. Dickinson)	200	0	0.0
	Kent (D. E. Pomeroy)	269	2	0.74
	North Yorkshire (I. F. Stewart)	271	5	1.84
	Dumfriess-shire (I. F. Stewart)	300	1	0.33
Wheatear (*Oenanthe oenanthe*)	South Wales (H. Dickinson)	*c.* 100	0	0.0
Sedge Warbler (*Acrocephalus schoenobaenus*)	Bardsey (H. Dickinson)	*c.* 150	0	0.0
Willow Warbler (*Phylloscopus trochilus*)	Irish Sea area (H. Dickinson)	700+	0	0.0
Chiffchaff (*Phylloscopus collybita*)	Irish Sea area (H. Dickinson)	700+	0	0.0
Starling (*Sturnus vulgaris*)	Staffordshire (G. A. and M. A. Arnold)	463	4	0.86
	——— (Boyd 1951)	300	1	0.33
	U.S.A. (Hicks 1934)	*c.* 10,000	38	*c.* 0.38
	Kent (D. E. Pomeroy)	105	0	0.0
	Cheshire (W. T. C. Rankin)	2,509	6	0.24
	North Yorkshire (P. A. Rayfield)	*c.* 3,000	1	*c.* 0.03
House Sparrow (*Passer domesticus*)	England (I. F. Keymer)	117	0	0.0
	North Yorkshire (I. F. Stewart)	113	1	0.88
	Passerine total	*c.* 19,427	60	*c.* 0.32

*Since these birds are mostly ringed at night, only gross deformities would be noticed

TYPES OF DEFORMITY

The most satisfactory classification of deformities would be one based on their causes, but these are often unknown. Hence the system used here is mainly morphological, but inevitably there are some examples which do not fit into anything but a "miscellaneous" section.

(*a*) *Temporary*

According to Wilkinson (1953), temporary deformities have been recorded several times amongst cage birds. He attributed this to faulty feeding, but gave no actual examples. The only specific record which I have found concerns a Zebra Finch (*Taeniopygia castanotis*) in which the cock "continually developed the upper mandible until it had increased by nearly a quarter of an inch, in a downward curve. The abnormal part would then drop off, and growth continue as before" (Rankin 1953). A wild male Great Tit (*Parus major*) observed by Howard (1951) had a bill which was normal up to the age of four years; the upper mandible then began to grow until after four months it was double the length of the lower, which remained normal. Exceptionally fierce bill-wiping (which had not been seen before) took place on the two days before the young of this bird were due to hatch; when they did hatch, the bird's bill appeared to be normal again. However, the upper mandible began to grow again a few months later, and in six months had reached the same size as before.

(*b*) *Permanent*

Crossed mandibles. This is a relatively common abnormality which has been recorded in a wide range of species—for example, the Linnet (*Carduelis cannabina*), Hooded Crow (*Corvus corone cornix*), House Martin (*Delichon urbica*) and Robin (*Erithacus rubecula*), to name but a few. Typically, the bill appears as in the Crossbill with the upper mandible decurved, the lower mandible upcurved, and the two crossing towards the tip, but without any significant elongation. However, elongation does occur in some instances, the Blue Tit (*Parus caeruleus*) shown in Fig. 2 being an example. As in the Crossbill itself, crossing may be left to right or right to left (see page 52). It is interesting to note that

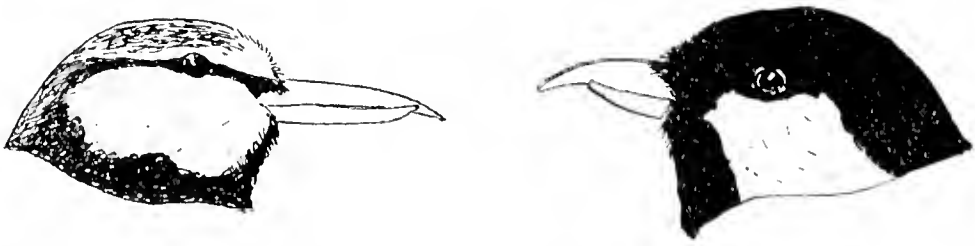


FIG. 2. Blue Tit (*Parus caeruleus*) with crossed mandibles and some elongation. Great Tit (*Parus major*) with the upper mandible slightly decurved

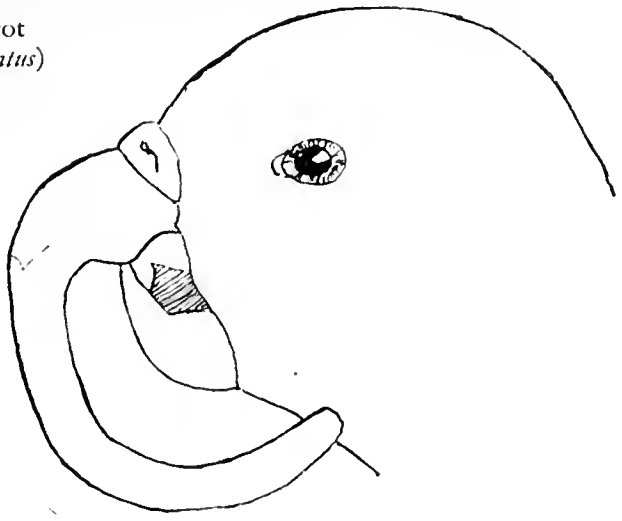


FIG. 3. Twenty-eight Parrot (*Barnardius zonarius semitorquatus*) with the upper mandible extremely decurved

a straight bill has been observed as an abnormality in the Crossbill (Rzehak, quoted by Duerst 1909).

Upper mandible decurved. This too is a fairly common deformity, affecting such varied species as the Rook (*Corvus frugilegus*) and Corn Bunting (*Emberiza calandra*), and the Feral Pigeon (*Columba livia* var.), in the last of which it is particularly common (D. Goodwin). The extent of the overgrowth of the upper mandible varies considerably: in the Continental Great Tit (*P. m. major*) shown in Fig. 2, it was only slight (15 mm; 10-11 mm. being the normal length for this race); in the Australian Twenty-eight Parrot (*Barnardius zonarius semitorquatus*) shown in Fig. 3, however, it was extreme. This bird suggests that the overgrown part continues on the same curve as the normal part of the bill. In Passerines, therefore, one would expect the curvature to be slight, as it was in the Great Tit already mentioned; and this appears to hold good in most cases (*cf.* Engels 1940). In Feral Pigeons, however, overgrown upper mandibles appear to be strongly hooked in most instances (D. Goodwin, W. Shipp). In most cases where definite information is available, overgrowth and downcurving of the upper mandible is associated with the tip of the lower mandible being broken off or otherwise damaged (e.g. the Starling in Fig. 4); or,

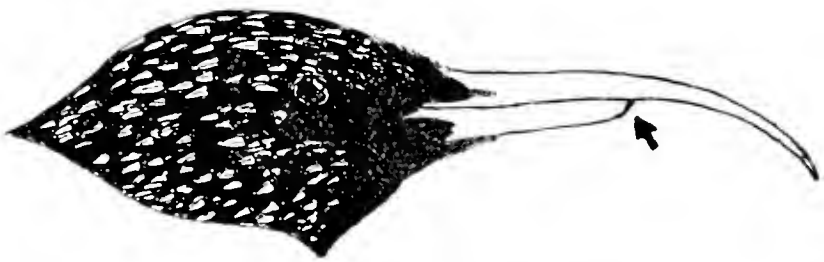


FIG. 4. Starling (*Sturnus vulgaris*) with the upper mandible decurved, probably because the tip of the lower has been broken off

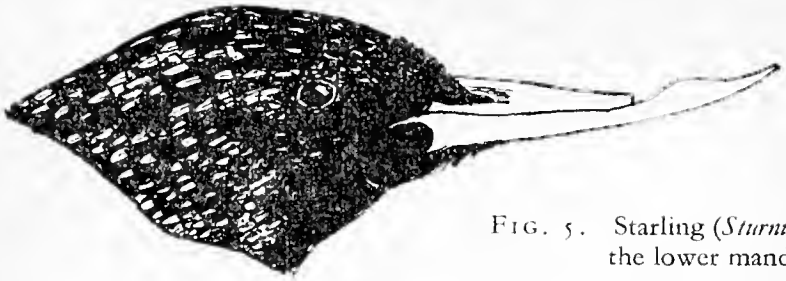


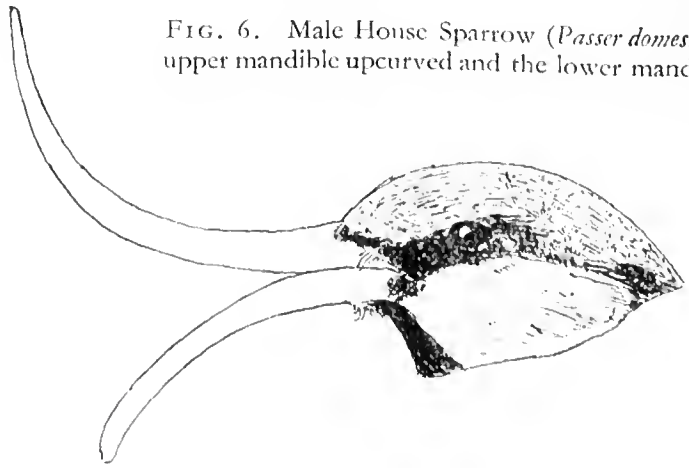
FIG. 5. Starling (*Sturnus vulgaris*) with the lower mandible upcurved

alternatively, the two mandible tips not corresponding (e.g. the Blue Tit and Great Tit in Fig. 2). In other words, this type of overgrowth occurs when the tips of the two mandibles do not approximate (see below) and a rather unusual illustration of this fact was the recent case of a female Rook whose lower mandible had become stuck through the skin of her upper breast, with the result that she could not close her bill and both mandibles became elongated and slightly curved (Nevin 1962). The exceptions to all this are those species in which the tips do not approximate normally—e.g. Psittacines and raptors, in which no cases of overgrowth are known in wild birds.

Lower mandible upcurved. This is rare, apparently only occurring when the tip of the upper mandible is missing. The only certain cases seem to be a Starling in the British Museum (Natural History) (Fig. 5) and a Great Crested Grebe (*Podiceps cristatus*) seen on Queen Mary Reservoir, Middlesex (Bruce 1952); a record of a Rook quoted by Groebbels (1932) is probably of a similar kind. There is also one record of the whole bill being upcurved slightly, in a Snipe (*Gallinago gallinago*), no elongation being involved in this case (Bottomley 1957 and *in litt.*).

Upper mandible upcurved and/or lower mandible decurved. This can be one of the most spectacular types of deformity, as in the House Sparrow shown in Fig. 6 (Donark 1950) where the lower mandible was 31 mm. long, the upper one 44 mm. long and the tips of the mandibles 51 mm.

FIG. 6. Male House Sparrow (*Passer domesticus*) with the upper mandible upcurved and the lower mandible decurved



apart! Another House Sparrow (Petit 1926) had the upper mandible normal, whilst the lower one was decurved and reached a length of 40 mm. A third House Sparrow (Hantzach 1902) had the upper mandible upcurved and 31 mm. long, the lower being straight and only half as long; and a fourth (Piechocki 1952) had the upper mandible normal whilst the lower was downcurved and reached 30 mm. in length. Although most frequently recorded in the House Sparrow, this type of deformity does occur in other species. For instance, a Song Thrush (*Turdus philomelos*) in the City of Leicester Museum has a beak curving over in an almost complete loop, the tip being just above the nostrils and pointing forwards (T. A. Walden). Another record concerns a Starling whose upper mandible was curved back over its shoulder, so that when seen in flight it appeared to be carrying a short twig (*The Lincolnshire Chronicle,* November 1957).

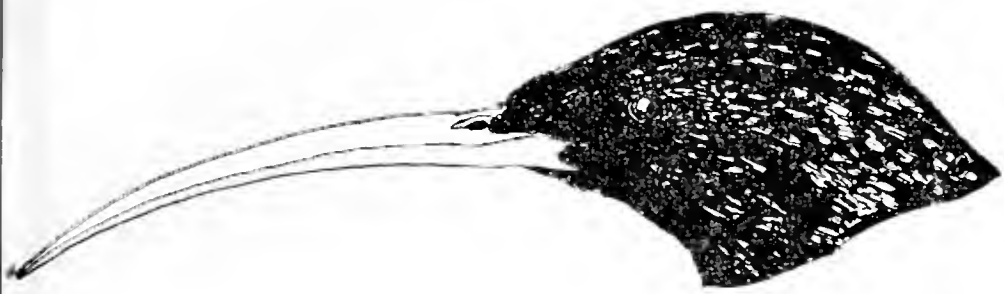


FIG. 7. Starling (*Sturnus vulgaris*) with the whole bill elongated and downcurved

Elongation. This, a fairly common deformity, is nearly always associated with a down-curving of the bill, and may therefore be described as "curlew-type". Typically, elongation affects both mandibles equally (e.g. Fig. 7 and plate 9b). Deformities of this sort are common in Starlings, a length of two and a half inches having twice been recorded (Dady 1951; and a specimen in the Royal Scottish Museum, quoted in *British Birds,* 44: 349). A remarkable case is that of a Californian Thrasher (*Toxostoma redivivum*) in which the lower mandible was 112 mm. long and decurved through about 150°, while the upper mandible had broken off at 69 mm. (Fox 1952). The normal length is 32-39.5 mm. and decurvature about 30° (Engels 1940). As might be expected, the tips of these elongated mandibles are very thin, and therefore become broken quite frequently. In the case of a Nuthatch (*Sitta europaea*) whose bill grew to about one and a half times the usual length, the extended part was sufficiently weak for the tips to break off, leaving a bill of normal size (M. Bryant). Occasionally the mandibles become laterally twisted to some extent. The degree of curvature varies considerably, as can be seen from a comparison of Figs. 3 and 7. A pronounced curvature might be expected in a parrot, but in fact it

also occurs elsewhere, as in the Californian Thrasher already mentioned and a House Sparrow recorded by Moltoni (1949); the latter had a bill which was 30 mm. in length and decurved through more than 90°. Engels (1940), who was studying bill curvature in thrashers in general, found that not only does the degree of arc become greater in longer bills—as would be expected—but the degree of curvature also becomes greater in the more distal part of the bill. This would account for Fox's Californian Thrasher, and perhaps for some of the other cases, but certainly not all of them.

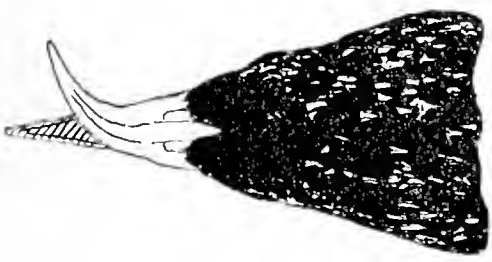


FIG. 8. Starling (*Sturnus vulgaris*) with the upper mandible curved to the right

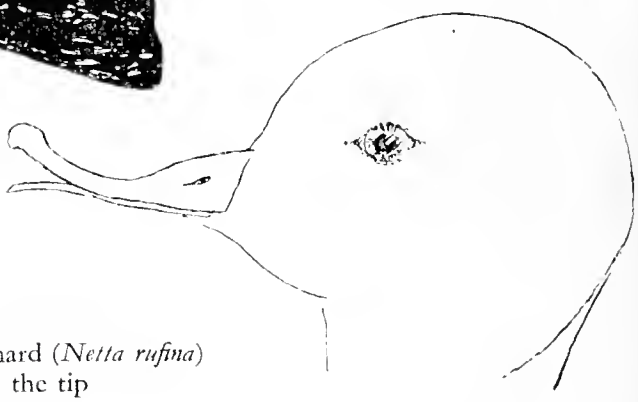


FIG. 9. Red-crested Pochard (*Netta rufina*) with the bill splayed out at the tip

Lateral curvature. Deformities of this kind are very unusual. Groebbels (1932) referred to a Rook in which the upper mandible was broken and the lower turned to the left; he also recorded a Swallow (*Hirundo rustica*) which had a bill turned to the right, and a South American parrot of the species *Amazona leucocephala* whose beak "turned outwards". The only other recorded examples are the Starling shown in Fig. 8, where the lower mandible appears normal, but the upper mandible is turned to the right (R. R. Lovegrove) and a Northern Red-breasted Sapsucker (*Sphyrapicus varius*) whose elongated upper mandible was curved "far over to the right" (Bowles 1908).

Locked bills. Three cases have been recorded (see *Field*, 1958): the tip of the upper mandible pierced the skin between the two rami of the lower mandible, probably as a result of an accident, such as crash-landing bill first on to a hard surface. The birds concerned were a Pheasant (*Phasianus colchicus*), a Partridge (*Perdix perdix*) and a Fantail Pigeon. A similar instance involving a Snow Bunting (*Plectrophenax nivalis*) took place on Fair Isle in October 1955 (I. J. Ferguson-Lees).

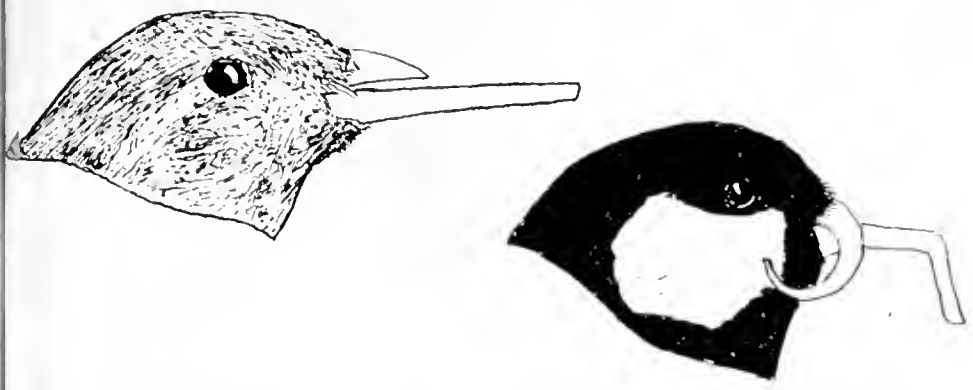


FIG. 10. Female House Sparrow (*Passer domesticus*) with the lower mandible elongated in the form of a trough, the tip being as wide as the base and open. Great Tit (*Parus major*) with the upper mandible decurved to pierce the cheek and the lower mandible elongated and twisted

Miscellaneous. A few examples will serve to show the range of other abnormalities which exist. The Red-crested Pochard (*Netta rufina*) illustrated in Fig. 9 had a bill which was normal at the base, but splayed out distally in such a way that it could not be closed (Viscount Chilston) (it is possible that this was a case of the upper mandible being upcurved). One Black-headed Grosbeak (*Pheucticus melanocephalus*) has been described as having a flange of rhamphotheca on the left side of the lower mandible, extending across the side of the upper mandible to such an extent that "the bird could only have fed from the right side, and must have been considerably handicapped" (Loye Miller, quoted by Fox 1952). In the House Sparrow shown in Fig. 10, the upper mandible was normal but the lower, instead of coming to a point, was in the form of a trough, which was just as wide at the tip as at the base, the tip being open; and it was 27 mm. long (von Madarász 1902). A Starling in the British Museum (Natural History) has a similar lower mandible which, although rather worn, is 46 mm. long; this bird's upper mandible is enlarged at the base and broken off short. Similarly, the lower mandible of the House Sparrow in Fig. 6 also appears to be trough-shaped, as well as decurved, and the same applies to Petit's House Sparrow mentioned on page 57. It seems possible, however, that each of these "troughs" was the result of the tip breaking off from a mandible which had been longer still. A most extraordinary deformity occurred in the Great Tit represented in Fig. 10, which was killed on 14th December 1891 at Zemplen in Hungary. The upper mandible curved down to such an extent that the tip pierced the bird's cheek, whilst the lower mandible stuck out forwards and was twisted "like a cow's horn" (von Madarász 1902).

MORPHOLOGY

In most cases, all that is recorded is the outward appearance of the

deformity, with no reference to the underlying structures. However, Fox (1952) stated that X-ray photographs of the deformities of a Scrub Jay (*Aphelocoma caerulescens*), a Red-breasted Sapsucker and a Californian Thrasher suggested that the bony portions of the bill were normal; and that the abnormal growth was limited to the dermatheca. He concluded from this that the abnormalities were due to damage of the rhamphotheca, but he presented no evidence as to how such damage might come about. There is, however, one case where a deformity may have been due to damage. An Oystercatcher (*Haematopus ostralegus*) recorded by Rutherford and Wagstaffe (1955) showed evidence of shot-gun wounds at the base of each mandible, which were both overgrown and had the tips crossed. It seems possible, but not conclusive, that this may have been due to the damage caused by the pellets.

A few other points seem worthy of mention. In the old cock House Sparrow described by Hantzsch, and already mentioned here on page 57, "the condition of the beak near its base was bony, rather than horny, the colour there being lighter than towards the tip". Unfortunately he gave no further information, except that the feet were in poor condition. There are other records of unusual coloration: for example, a curlew-billed Starling had a broad blackish-brown band halfway down the otherwise normally coloured bill (Huyton 1953). In general, however, the bill coloration seems to be the same in abnormal as normal birds.

Little is known about regeneration of broken parts of the bill. Groebbels (1932) recorded an Eagle Owl (*Bubo bubo*) which broke off a bit of its upper mandible; this then regenerated, after which it was abnormally long. Groebbels also recorded that Bordage noted regrowth of broken edges of the bills of storks (*Ciconia*) and chickens (*Gallus*). This appears to be all the available information concerning regeneration. In many birds where the mandibles are broken, the damaged part heals off; this would seem to be a protective function. Mercier and Poisson (1927) noted that the tongues of domestic fowls became tougher when the beak was crossed. Stabler (1938) found a similar thing in a Chinese Ring-necked Pheasant which also had crossed mandibles. Presumably this is a result of the sharp edges of the mandible causing fibrous tissue to form in the tongue.

CAUSES

(*a*) *Genetic*

Despite the conspicuousness of some bill abnormalities, and the widespread belief that they are inherited, there is little evidence that this is so, although other dermal and epidermal abnormalities, such as albinism and comb formation, have received much attention from geneticists.

Hodges (1952) found that two out of four nestlings of an American Robin (*Turdus migratorius*) had crossed bills, whilst the other two nestlings and the parents were normal. An obvious explanation is the recombination, in two of the offspring, of recessive factors present in both parents. Mercier (1926) mated a female domestic fowl that had a crossed beak with a normal male. Thirty-four eggs were laid; three were infertile and five chicks died before hatching. Of the remainder, some were normal, but others showed a variety of defects, including crossed bills (three crossed at hatching and a fourth later), rickets, brittle feathers and dwarfism. The occurrence of four offspring with crossed beaks suggests that this anomaly was inherited.

However, cage birds often show bill abnormalities, which aviculturists are prone to correlate with nutritional deficiencies. Hutt (1949) in his account of the genetics of the domestic fowl that "only a small proportion of birds homozygous for hooked beak is visibly affected", and Landauer (1938) found it impossible to produce a true-bred crossbilled fowl, despite considerable inbreeding.

So even the case of the American Robins, quoted above, may not be as simple as at first might seem; and further data on this subject are clearly needed.

(*b*) *Accident*

If the bill of a bird is damaged, it may respond in various ways. Damage to the bone can be only locally repaired. However, if only the rhamphotheca is injured, regeneration may occur and this has been recorded occasionally.

Hutt (1949) believes that the commonest deformities of the domestic fowl, namely unilateral microphthalmia and anophthalmia, are probably accidental in origin. In microphthalmia the upper mandible is decurved and laterally displaced, the eye is reduced on the same side as the bill displacement and there are other defects. Anophthalmia is a more serious form of the same phenomenon. Both conditions are prenatal and most of the chicks never hatch. The occurrence of these deformities is increased by unfavourable incubation conditions (Landauer 1938).

Nestlings falling from the nest often land on their beaks and cause permanent damage which results in a displaced or deformed bill in the adult. This is of concern to breeders, but wild birds falling from the nest are unlikely to survive, of course. Accidental damage to the beaks of adult birds is probably rare, but it does occur. Examples are the Starlings shown in Figs. 4 and 5, where the tips of lower and upper mandibles respectively had been broken off. It is immediately obvious in both these cases that the opposite mandible has overgrown considerably and, as already mentioned, it appears that in most species each mandible owes its usual length to wear on the other. This

wear occurs largely in normal feeding activities. When the tip of the upper mandible is broken off in some way, there is no longer a wearing surface for the tip of the lower mandible, and it therefore lengthens unopposed; and vice versa. Similarly, the tips will continue to grow if they are slightly crossed, as appears to have happened in the Blue Tit in Fig. 2. This slight lateral displacement, which may be accidental (perhaps due to slight asymmetry of the jaw) is probably a purely mechanical effect, and different from the curving of the crossbill-type and the elongation of the curlew-type, both of which are suggested to be genetically caused.

In species where the tips of the mandibles do not normally oppose each other, e.g. many raptors, increase in length may be limited by wear and tear during feeding, since the beaks of birds of prey are inclined to overgrow in captivity unless they are given bones to pick (J. J. Yealland).

(*c*) *Disease*

Since the horny covering or rhamphotheca of the bill is produced by the underlying epithelial dermotheca, it is quite possible that diseases of the latter could lead to deformities of the former. However, there appear to be no records in which this has been shown.

Another and quite different cause of deformity might be due to parasites damaging the dermotheca. Appleby (1958), referring to Budgerigars (*Melopsittacus undulatus*), stated that *Cnemidocoptes pilae* (a mite) "may be responsible for damage to the developing beak in nestlings, resulting in later deformity". This view was supported by Keymer (1958), for the same species. There are no similar records for other species, but this may be due to lack of observation, and it could well be that such irregular growths as that of the Great Tit in Fig. 10 are due to this cause. The irregularity could be due to the parasite attacking the tissues for a relatively short period, causing uneven growth at this time. *C. pilae* has been recorded from the Hoopoe (*Upupa epops*) and the Alexandrian Parakeet (*Psittacula nipalensis*) as well as from the Budgerigar. However, it is the only mite which is known to attack the beak (G. O. Evans *per* P. N. Lawrence).

Some cases occur in which the abnormality appears to be a superficial growth that is presumably due to some disease, and the bill is otherwise unaffected. Schauberg (1901) recorded a remarkable instance of a Curlew (*Numenius arquata*) with a swelling on its upper mandible; this swelling resembled a potato in shape and colour, and was sufficiently large to be seen with the naked eye at a considerable distance. The bird was later found dead, with an empty stomach.

(*d*) *Other causes*

Birds kept in captivity sometimes suffer bill deformities as a result of

incorrect feeding, lack of grit or related causes. These may be permanent or only temporary (e.g. Wilkinson 1953, Rankin 1953). However, the processes involved in such deformities are obscure; to quote Groebbels (1932), "Holmgren found that pigeons fed on fibrin and meat grew elongated and downward-curving bills. Brandes, who repeated the experiment, came to an entirely negative conclusion."

J. J. Yealland says that in the London Zoo few birds suffer deformities; those that do are principally parrots, but include some birds of prey and waders. Other species which may be affected in captivity include Choughs (*Pyrrhocorax pyrrhocorax*) (B. C. Turner) and various finches (Groebbels 1932). All these are birds whose beaks are, in the wild, subject to heavier wear than those of purely insectivorous species—on food, stones, sand or other abrading surfaces.

The effects of what has been called "industrial contamination" have been suggested as the cause of some deformities (Ash 1958). The birds concerned were a House Sparrow and several Partridges. Their bills were overgrown (three or four times the normal size) and badly mis-shapen. They were examined by Dr. J. M. Harrison who pointed out the presence of warty excrescences which, he said, might have been caused by a carcinogen. Except for the sparrow, the birds were otherwise in good condition, but all showed very dirty plumage. The deformed Partridges were found near a Yorkshire colliery, the sparrow at Gravesend.

BEHAVIOUR AND SURVIVAL

(*a*) *Behaviour apparently not affected*

I have received a total of 48 records in which the behaviour of a bird with an abnormal bill was observed, and in only eight was there no apparent alteration in habits. Seven of these eight (including five Starlings) referred to wild birds in which the abnormality took the form of elongation, although in one case (a Blue Tit) there was also some lateral displacement. The last bird, whose bill was not elongated, was a captive cock Budgerigar with the lower mandible knocked to one side; this did not prevent him from feeding himself successfully and his mate "quite well", however (F. C. Gower). In the case of the seven wild birds, it would probably be more accurate to say that no irregularities in behaviour were seen: on the whole it seems unlikely, for example, that a Starling with a curlew-type bill would be as successful at preening, or feeding its mate, as a normal one.

(*b*) *Behaviour definitely affected*

The forty cases of abnormal behaviour included nineteen Starling records and twenty-one of fifteen other species. In ten different species, ranging from Starling and Blackbird to Green Sandpiper (*Tringa ochropus*), and Chough to Great Tit, the head was turned on one

side to feed. For example, a Starling recorded by Dady (1951) in Regent's Park, London, with a decurved bill about two and a half inches long, turned its whole head on one side to pick up food at about the same distance from the base of the bill as it would have done if it had been normal. A Starling reported by B. C. Turner, with a very long decurved upper mandible and apparently normal lower mandible, used the long tip as a probe for testing potential food. Its head was then turned on one side, and it picked its food up at the tip of its lower mandible. Another Starling, reported by Warham (1951), had a sharply decurved upper mandible and a deformed or broken lower mandible, and it fed by a series of sideways scooping movements which, however, were not always successful. Warham noted that this bird seemed more quarrelsome when feeding than the other Starlings with which it associated. B. Coleman, on the other hand, observed that a Starling with a very long, thin bill would not feed whilst other Starlings were feeding—suggesting some fear of them.

Turning the head on one side to feed leads, after a time, to some abrasion. In the case of a Green Sandpiper (Amann 1950) where the upper mandible was 3 mm. shorter than the lower, one side of the bill was worn, showing that the head had been turned to that side when feeding. Two Starlings with elongated bills had the lores bare, presumably for a similar reason (P. A. Rayfield, Williamson 1951).

The Red-breasted Sapsucker (Bowles 1908) whose upper mandible was about two and a half times the normal length, and which fed by turning its head on one side, evidently had no difficulty in feeding and was fat and healthy. Similarly, a cock Great Tit with an elongated upper mandible learnt to tilt his head on one side to pick up food (Howard 1951). His mate at first hesitated to accept food, but soon learned to turn her head on one side too. The House Sparrow with the incredible bill shown in Fig. 6 survived for a year and a half—throughout which period the bill was growing—by scooping up grain with its head turned to one side and flat on the ground (Donark 1950). This was an artificial source of food, of course; it is doubtful whether the bird could have lived in the wild state with such a bill. A similar case concerned a Blackbird with elongated and crossed mandibles, which survived for three years on food given to poultry and came to judge their feeding time with considerable accuracy (W. S. Craster).

A remarkable change of behaviour occurred in a Hoopoe which was wounded by gunshot in the upper mandible. It was kept in a large cage, and procured its food by scratching with its feet. "When a worm turned up, it threw it with great skill with its lower mandible into the air, and then caught it in flight" (Count Emilio Ninni, quoted by Moltoni 1949).

A cock Blackbird, believed to be ten years old (a considerable age for this species), suffered a broken upper mandible in an encounter

with a cat (J. Burton). This bird also fed by putting its head on one side and scooping up food provided for it in a garden. It drank by catching drops of water from leaves or drainpipes. Drinking is clearly a problem for many birds with bill deformities. Captive Choughs, in which the bill frequently becomes overgrown in such a manner that the tips cross, both feed and drink by turning their heads slightly to one side. In this case, however, the action is part of these birds' normal behaviour pattern, as apparently the head is also inclined sideways when drinking from very shallow water (B. C. Turner). A Starling with an elongated upper mandible drank similarly (K. G. Clark *per* I. D. Woodward). There are no other drinking records.

A case of a deformity in one bird leading to an alteration in the behaviour of another has already been mentioned (the Great Tit feeding its mate). A most remarkable case involving more than one bird relates to a male Black-headed Grosbeak which was collected in 1926 by Dr. Loye Miller (Fox 1952). It had a flange of rhamphotheca on the left side of the lower mandible extending across the side of the upper mandible, so that "the bird could only have fed from the right side, and must have been considerably handicapped". Nevertheless, it was apparently in good condition. Dr. Miller had seen one grosbeak feeding another and presumed that it was the male courtship-feeding the female; however, the deformed bird which he shot proved to be the male. Fox continues: "There was no doubt in his mind that a hen had been feeding the cock. It seems probable that the well-fed condition of the cock, and his recent obviously successful migration, had been made possible by the efforts of the hen. At least, as a result of the cock's handicapped condition and the attention shown to him by the female, the dependency of the cock on the hen for an extended period seems evident." This would be quite remarkable and it is unfortunate that its absolute veracity is in doubt.

The extraordinary thing about all these birds is that they survive at all. In addition to the cases already discussed, two more deserve attention. The first concerns a Pink-footed Goose (*Anser brachyrhynchus*) which had had half of its upper mandible shot away (G. Atkinson-Willes). The injury was obviously an old one, since the damaged part showed a considerable amount of new growth and the tooth at the tip of the lower mandible had become enlarged, presumably from lack of wear. How a grazing goose could survive with such an injury—and it was in good condition when shot—is indeed a problem. So is the case of the young Hawfinch (*Coccothraustes coccothraustes*) shown in plate 9a. This bird, whose partial lack of bill appeared to be congenital, was ringed near Basle, Switzerland, and shot 43 days later about 460 kilometres away in the south of France (Amann 1950). Its weight was normal and it had evidently migrated normally, although only for the proximal 2 mm. of the bill did the mandibles meet.

TABLE 3—WEIGHTS OF BIRDS WITH ABNORMAL BILLS

Those marked with an asterisk were apparently migrants and the "normal" weights for the species have been taken from Browne and Browne (1956) and Turček (1956), except in the case of the Hawfinch where the "normal" weight is the range of six others caught on the same day. Each of the other three "normal" weights is that given by the authority concerned. The Crested Lark had been refrigerated for several days beforehand and so may have been below its true weight. K. Williamson described his Blackbird as "abnormally low, even for a migrant" and his Meadow Pipit as "quite good for a migrant"

Species	Deformity	Weight (gm.)	"Normal" weight (gm.)
Bar-tailed Godwit (*Limosa lapponica*)	Rami of lower mandible unfused (Harrison 1947)	227	340
Crested Lark (*Galerida cristata*)	Bill elongated (Moltoni 1949)	36	40-45
Magpie (*Pica pica*)	Upper mandible elongated and decurved (B. C. Turner)	220	210
*Blackbird (*Turdus merula*)	Upper mandible 3.5 mm. short (K. Williamson)	83.27	80-96
*Blackcap (*Sylvia atricapilla*)	Upper mandible elongated and decurved (Ruttledge 1952)	19.81	17-20
*Meadow Pipit (*Anthus pratensis*)	Lower mandible 2 mm. short (K. Williamson)	18.2	19
*Hawfinch (*Coccothraustes coccothraustes*)	Bill congenitally underdeveloped (F. Amann)	50.2	48.59

Weight can be taken as some indication of general condition. Birds with abnormal bills have been weighed on several occasions and the results are set out in Table 3. It will be seen that only the Bar-tailed Godwit (*Limosa lapponica*) had a weight appreciably lower than normal, which is at first sight surprising and suggests that the birds were able to feed themselves quite well, despite their deformities. Nevertheless, it is evident that nearly all the birds mentioned in this section showed some plasticity in behaviour. A number of examples have already been given in which individuals learned to feed themselves by turning their heads on one side. Other aspects of behaviour are also affected: feeding the mate, drinking, and possibly reactions towards, or by, other members of the same species. Greater tameness has been recorded several times: this gives access to readily obtained food, but may be the result of near-starvation, just as birds become tamer in very cold weather. Feral Pigeons, of course, subsist to a very large extent on food provided, intentionally or otherwise, by man. Overgrowth of the upper mandible is particularly common in these birds, and probably associated with a short lower mandible (D. Goodwin). Changes in feeding habits, especially with regard to the type of food taken, are well known in birds (e.g. tits and milk bottles), and there is clearly an advantage towards survival for a bird with a deformed bill that can adapt its feeding methods.

The ease with which a bird can adjust its motor patterns of behaviour probably depends, amongst other things, on the speed of the onset of the deformity. Presumably it is more difficult for a bird to survive if the change is sudden (e.g. due to injury) rather than slow (e.g. due to overgrowth); but there are no data on this point, as yet. It would also be interesting to know whether the chances of survival are higher in juveniles than in adults.

Whilst the number of deformed birds which survive is remarkable, inevitably there are many which do not. A minority of those recorded have been described as thin and weak, with the feathers in poor condition. D. Goodwin noticed that Feral Pigeons with badly overgrown beaks were characterised by drooping wings (the primaries actually dragging on the ground), uplifted tail and thrown-back head. Nevertheless, of the 60 or so records of Starlings with abnormal bills, excluding those "collected", there is only one in which the bird died and that was nearly two years after it was first seen (P. W. D. Waite). On the other hand, of five Oystercatchers with elongated bills (which in three cases were also crossed and curved), all but one were found dead (J. B. Bottomley, Miss A. M. Mackintosh, W. T. C. Rankin 1953 and *in litt.*, and Rutherford and Wagstaffe 1955); in two cases this followed a cold spell. The only other record of death in a wild bird concerns a melanistic Blue Tit with curved and elongated mandibles, which was found drowned in a shallow bowl "from which a normal healthy bird would have had no difficulty in escaping" (Sage 1956). There is also circumstantial evidence in the case of the Great Tit shown in Fig. 2 that it did not survive the winter (P. P. G. Bateson).

Four birds actually appeared to gain some advantage from their deformities. A. D. Townsend watched a Great Tit with an elongated and crossed upper mandible (the tip of the lower being broken) and found that it could not only feed normally on fat, but also seemed to extract nuts from their shells faster than a normal bird, although it had some difficulty in picking them up afterwards. W. P. White made similar observations on another Great Tit, which also appeared to gain advantage in threat displays at a Chaffinch (*Fringilla coelebs*). The Red-breasted Sapsucker observed by Bowles (1908) used its long upper mandible rather like a nut pick, digging insects to the surface with it, and then picking them up by turning its head to one side. A hen Indian Silverbill (*Euodice malabarica*) belonging to A. H. Hayes had the mandibles slightly overgrown and crossed; it had difficulty in cracking seeds, but found the sharp points useful in squabbles with other females!

Although a number of birds have had their deformities "manicured" with nail-clippers and scissors, there is, regrettably, only one record which throws any light on subsequent behaviour. This concerns a Feral Pigeon which, although free-living, had been hand-fed from the

nestling stage to an age of 19 months (W. Shipp and K. N. Brockhouse). Its upper mandible was strongly decurved and there is no doubt that the bird owed its survival to being hand-fed. However, its beak was eventually trimmed to normal length and it was then kept in a cage for several days, during which time it learned to feed itself for the first time in its life. It was finally released, and was still alive four months later.

(*c*) *Parasites*

Preening cannot be performed so effectively by a bird whose bill is abnormal, particularly when, as in most cases, the tips of the mandibles are not closely opposed. A number of records refer to the poor condition of the plumage, but by no means all. For instance, J. H. Lawton has described a Starling whose mandibles were considerably elongated and decurved, the upper being about one and a half centimetres longer than the lower. Observation on one occasion showed that the bird had difficulty in reaching all of its upper breast and nape and the side of its neck. The projection was of some use in reaching the ends of the wings and tail, however, and the bird was always well preened despite its handicap.

Removal of parasites also requires a normal bill with the tips approximating closely, so that it is to be expected that birds with deformed bills would have more parasites (see Ash 1960). It is interesting in this connection to compare the normal infestation rate of the Crossbill with that of other finches. Although the sample is rather small, the figures given in Table 4 can be taken as a general indication that the Crossbill is more highly infested than the other two species and this is probably because its bill is less effective in the removal of ectoparasites.

Kartman (1949) found that domestic fowls which had been debeaked* were significantly more infested with lice than normal birds, and it seems likely that this holds good for all species which actively remove ectoparasites, except perhaps those which take dust baths (when some may be removed). The Starling certainly uses its beak for delousing, as was shown by the presence of lice in the stomach contents of Starlings analysed by Fox (1940). Of three hundred Starlings examined by Boyd (1951), there was only one with a deformed bill and that was heavily parasitised with Mallophaga.

There are very few other records relating to wild birds, but this is probably a reflection of the small number of people who look for parasites. Rothschild and Clay (1952) examined a Robin with most of its upper mandible missing and it was "infested with 127 specimens of *Ricinus rubeculae*, the numbers of which rarely exceed 15 on any

*Tip of the upper mandible cut off, to prevent the birds from severely pecking each other. Food is easily scooped up, with the lower mandible used as a shovel.

TABLE 4—LICE INFESTATIONS IN CERTAIN FINCHES

This is drawn up from information kindly supplied by Miss T. Clay. All percentages and averages are rounded to the nearest whole number

Species	Number deloused	Birds definitely infested No.	%	Numbers of Mallophaga Total	Average
Crossbill (*Loxia curvirostra*)	40	39	97	556	14
Bullfinch (*Pyrrhula pyrrhula*)	47	28	60	184	4
Chaffinch (*Fringilla coelebs*)	159	51	32	365	2

normal bird". Ash (1960) recorded a Willow Warbler (*Phylloscopus trochilus*) with a crossed mandible and a House Sparrow with a lower mandible over two centimetres long, both heavily infested with Mallophaga. On the other hand, D. Summers-Smith has reported that a Robin with a crossed bill was not heavily infested.

The total number of parasites present may sometimes be very high. Worth (1940) found that a Slate-coloured Junco (*Junco hyemalis*) which had the distal part of its upper mandible missing was heavily infested with Mallophaga, whereas other birds trapped in the same locality at the same time had few parasites. Worth estimated that the Junco may have had over 5,000 parasites; but even this was exceeded by a Socotra Cormorant (*Phalacrocorax nigrogularis*) which had the tip of its upper mandible broken off and which had no less than 6,785 Mallophaga. The average for six others of the same species was 43 (Miss T. Clay).

SUMMARY AND CONCLUSIONS

(1) Abnormalities in birds' bills have been studied as the result of an enquiry combined with a survey of published records. Brief reference is made to the structure of normal bills.

(2) The limited available information on incidence suggests that the number of wild birds affected is well under ½%. Different types of abnormality are described and illustrated; the range is considerable.

(3) Possible causes are discussed. It is suggested that many instances are genetic, but there is no conclusive evidence for this and the way in which control is exercised must be complex. Other causes include injury and disease. In cage birds at least, incorrect feeding or lack of wear may be important.

(4) The behaviour of most birds is affected to a certain extent, and sometimes it may be quite different from the normal, particularly in feeding.

(5) Some birds with bill abnormalities suffer a high incidence of ectoparasitism, probably because of their inability to remove the parasites.

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Some photographic studies of the Swift

Photographs by Arthur Brook, C. C. Doncaster, C. Eric Palmar and H. N. Southern

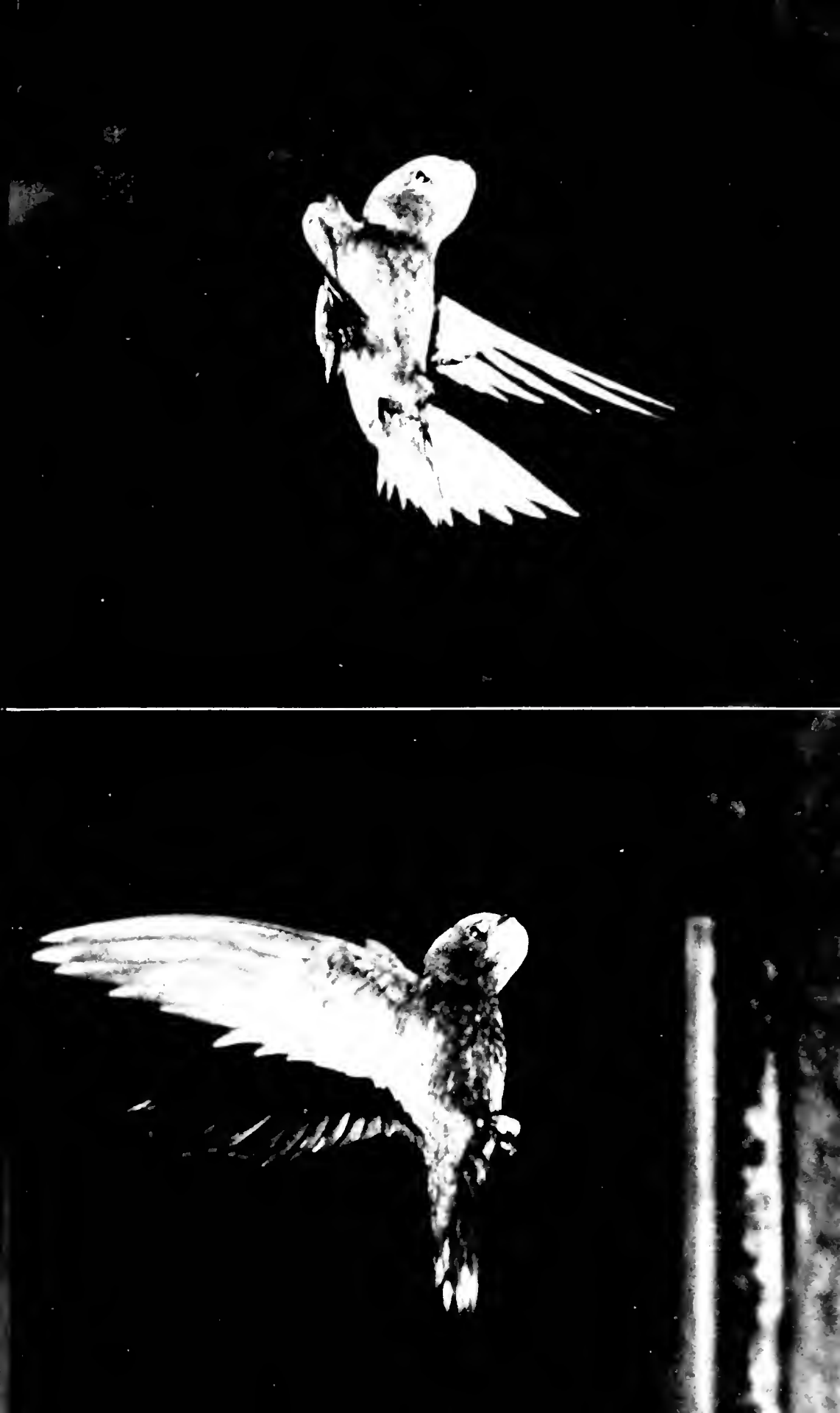
(Plates 10-18)

A YEAR AGO we published a selection of photographs of the Nightjar (*Caprimulgus europaeus*) (*Brit. Birds*, 54: 69-71 and plates 10-17). We made the point then that we hoped periodically to have other series of common birds, provided that they were of biological interest and sufficiently unusual. Five of the present fourteen photographs of Swifts (*Apus apus*) appeared in Dr. David Lack's *Swifts in a Tower* (1956), but the others have not been seen before and they include several unique shots of no little interest. It was, in fact, those on plates 11 and 12 which prompted the collection of the rest. The photographs on these two plates, and that on plate 10, were taken by the late Arthur Brook who died in March 1957 (*Brit. Birds*, 50: 435-436), and they were kindly brought to our notice by his great friend, Colonel H. Morrey Salmon. They have been offered for reproduction by permission of the National Museum of Wales, in which institution the copyright is vested.

Colonel Salmon writes: "I had several times suggested to Arthur Brook that the small breeding colony of Swifts inhabiting the roofs of a row of cottages close to his own house in Aberedw, Radnorshire, was a worthwhile target for photography, and in June 1956 he set to work in his own inimitable way. He synchronised one of his cameras to my high-speed flash outfit and constructed a support for it on top of a ladder. Since photographs of this kind cannot be taken satisfactorily in bright daylight conditions, the majority of the resulting exposures were made between seven and ten o'clock in the evening, which coincided with the time of day when the birds were perhaps feeding their young most actively. A fine sense of anticipation and judgement was necessary to catch the birds with the flash, for after their approach dives they would swoop upwards from about ten feet above road level straight under the eaves. But in this Arthur Brook excelled, in spite of the fact that he was then well over seventy and it was, in fact, only six months before the onset of his last, fatal illness.

PLATE 10 SWIFT *Apus apus* leaving nest-hole, Radnorshire, [illegible]. Compare the flat-throated appearance of this bird with the bulging throat of those arriving with food (plates 11 and 12). This unique series was taken by a [illegible] flash at a colony in the roofs of a row of cottages (page 721 *for* [illegible] *read* [illegible]).

PLATE 11 and 12. Swifts (*Apus apus*) returning to nest holes with throat pouches enormously distended by balls of insect food, Radnorshire, July 1956 (*cf.* departing bird in plate 10). Swifts normally bring between 300 and 1,000 small insect and spider at each visit to their young (page 73) (*photos: Ivchen Brook*)



PLATES 13 and 14. Swifts (*Apus apus*) and young in nest-hole, Hertfordshire, July 1937. The adult arriving with a food-ball again illustrates the grotesque throat pouch, while the photos opposite show the four young—instead of the more usual two or three—colliding with the inrushing parent (*photos: C. C. Doncaster*)

PLATE 15. Swifts (*Apus apus*) feeding young, Oxford, June–July 1954. Above, one day old. Below, three weeks later (here the second adult is moving off to the right). In each case the parent's beak is thrust into the chick's gaping mouth (page 73) and its nictitating membrane is covering its eye (*photos: H. N. Southern*)

PLATE 16. Swifts (*Apus apus*) at the nest, Oxford, May 1954. Above, mutual courtship preening by a pair of one-year-old birds; these build nests, but do not lay any eggs (page 74). Below, the rear bird rises off the eggs as its mate comes to relieve it with, as often happens, a feather in its beak (*photos: H. N. Southern*)

PLATE 17. Family party of Swifts (*Apus apus*) in the roof of a Glasgow tenement, summer 1951. The two adults are at the back and their hoary-headed young are in the nest-cup in front. Note the tiny beaks, deep-set eyes and long wings of these insectivorous and completely aerial birds (*photo: C. Eric Palmar*)

It was nearly as difficult to catch the birds leaving after feeding the young, as they dived out quite silently. No photographs of this species flying to its nest with food for its young had, I believe, ever been taken before and, when we developed our first exposures, made during July of that year, we were completely baffled by the appearance of the birds' heads as seen in the negatives. Not until we had made prints were we able to appreciate the enormous distension of the skin of the throat into a pouch packed with insects. The photographs (plates 11-12) show that this pouch extends not only below, but also forward to beyond the tip of the beak. Comparison should be made with the flat-looking profile of the bird leaving the nest after passing the food to its young (plate 10)."

The same distension of the throat pouch shows in C. C. Doncaster's photographs on plate 13, where an adult Swift is seen making its way along a two-foot "passage" between the entrance hole under the eaves and the actual nest. In his *Swifts in a Tower* (p. 82) David Lack wrote: "The parent swift returning with food for its young has a large bulge below the beak, due to the mass of insects packed into the throat and stuck together with saliva. There is usually a definite ball of food, though at times the insects adhere loosely . . . When the nestlings are very small, the adult produces only part of the meal at a time and may divide it among the chicks . . . But from the time the young are about a week old, the food is passed in one large ball to only one of them, and the feed lasts for only a few seconds." And later (pp. 100-101): "The swift usually brings just over one gram of insects to its young in each meal . . . We sometimes measured the speed of collection precisely, one parent (on a fine day) collecting 1.7 grams of insects in 64 minutes and another 1.2 grams of insects in 47 minutes. The largest recorded number of meals brought to one brood in a day was 42 . . . Each meal usually contains between 300 and 1,000 small insects and spiders, but a few meals with larger insects have contained only 100, while others with very small insects have had up to 1,500 individuals. The swifts which collected 42 meals in a day probably removed about 20,000 insects from the air in so doing."

Plate 15 illustrates the way in which the food is passed to the young, the adult placing its beak in the open mouth of the nestling. The position is the same whether the chick is newly hatched or well-grown (compare plates 15a and 15b), but in the latter case the youngster's huge gape almost encloses the adult's head, though the angle of the latter's jaw can still just be seen. These two photographs are part of the excellent series taken for David Lack at Oxford by H. N. Southern and they have already appeared in *Swifts in a Tower*. Reverting to C. C. Doncaster's photographs, which were taken at Hitchin, Hertfordshire, it should be noted that there are four young in the brood shown on plate 14. The normal is, of course, two or three.

The remaining photographs illustrate other aspects of the breeding biology. Plate 16b shows the change-over during incubation. David Lack recorded that the two parents take turn and turn about on the eggs and that they relieve each other about once every two hours. The sitting bird rarely leaves before its mate returns and sometimes is reluctant to go even then, so that the relieving bird has to prod it or gradually insinuate its body underneath. The sitter often greets the arrival of its mate with a scream or with mild threat display, and the newcomer sometimes brings a piece of grass or a feather. Young birds one year old do not breed, but they select a site, form a pair and build a nest which they occupy throughout the summer without laying eggs; they then usually return to this site the following year to breed. Such a yearling pair are shown in plate 16a, which also illustrates the mutual preening that is the chief courtship action of the species. Each bird preens mainly those parts of its mate's body which it cannot reach for itself—first the throat and then the head.

Finally, plate 18 reproduces C. Eric Palmar's remarkable picture of a screaming party. Though these occur throughout the breeding season and are one of the most characteristic sights and sounds of warm evenings in villages and towns all over the country, the birds dash past at such high speed that nobody else has succeeded in taking a successful photograph. These screaming parties are restricted to fine weather and, though they can be seen at any time of the day, they are most regular as dusk nears. Their precise function is not certain, but they probably play a part in keeping the colony together and they are particularly noticeable just before the birds leave on their way south in the autumn. They are clearly of no little significance, for the owners of nests often come out and join in when a screaming party flies past. I.J.F.-L.

South-eastern rarities at Fair Isle

By I. C. T. Nisbet

ONE OF THE MOST IMPORTANT results of Eagle Clarke's (1912) studies of migration in the early years of this century was his discovery that two species which breed in eastern and central Europe occur with inexplicable regularity in autumn in the Scottish islands. These are the Barred Warbler (*Sylvia nisoria*) and the Red-breasted Flycatcher (*Muscicapa parva*). Their common features are that they breed east and south of the Baltic Sea, extending only in very small numbers into Fenno-Scandia, and that they migrate more or less south-east in autumn, the flycatcher to winter-quarters in Asia and the warbler to

east Africa. Hence their occurrence in autumn in Scotland involves a displacement almost directly opposite to their normal direction of migration. This phenomenon is not unique to Scotland, but has also been reported from Norway (Schaaning 1939), Denmark (Christensen 1952), north Germany (Gätke 1891, Tischler 1941) and Finland (Snellman 1931).

Three writers have discussed these puzzling phenomena in recent years. Rudebeck (1956), following Otterlind (1944) and Christensen (1952), suggested that a small minority of the western populations migrate south-west or west in autumn, hence rendering themselves liable to drift north-westwards into the British Isles. However, Williamson (1959) found that a large influx of Red-breasted Flycatchers into Great Britain in September 1958 took place during clear weather when the winds were too light to cause much drift; hence he suggested that the birds involved must have been actively orienting downwind, and were probably juveniles whose normal orientation mechanism had not yet matured. Both Rudebeck and Williamson assumed that the birds were on a normal type of migration, initiated by the same weather factors as are the movements oriented towards the south-east. However, this assumption was undermined by Lack (1960a and b), who showed that Barred Warblers and Red-breasted Flycatchers usually arrive on the east coast of England and Scotland on different days from the majority of the commoner night-migrants from Scandinavia (for discussion of this conclusion, see Williamson 1961a and Lack 1961). Lack (1960a and b) also reported that the arrivals of the south-eastern vagrants were not well correlated with south-east winds in the North Sea, which would cast doubt on Williamson's hypothesis of downwind orientation. However, this conclusion needs checking, since the wind data used by Lack were selected to investigate westward drift of birds emigrating from Scandinavia, and hence may not have been fully relevant to the problem of the south-eastern vagrants.

In this paper I am re-analysing the data used by Lack (1960b) and I am proposing a new explanation of the occurrence of the south-eastern species, based on analogy with a migration problem I have studied in North America. This is the autumn migration of the Yellow-breasted Chat (*Icteria virens*).

THE YELLOW-BREASTED CHAT

The Yellow-breasted Chat, the largest of the North American wood warblers (Parulidae), breeds commonly throughout much of the United States, north to about 42°N, though only rarely north-east of the Hudson river. In autumn it emigrates to the south-west, but each year it is seen in surprising numbers all along the coast from New York City to Nova Scotia and Newfoundland, a thousand miles north-east of its breeding range.

This strange phenomenon was studied by Baird, Bagg, Nisbet and Robbins (1959), who found that most of the arrivals of Yellow-breasted Chats in the north-east in the autumn of 1958 took place in periods of hot, humid weather when tropical air was flowing north-east from the Gulf of Mexico—weather in which little southward migration of northern species could be detected. They suggested that these unseasonable weather conditions induced the Yellow-breasted Chats to reverse their orientation from south-west to north-east, and that the following winds then caused them to overshoot the north-eastern edge of their breeding range and reach areas far to the north-east. Baird *et al.* also found circumstantial evidence that similar reversed movements were responsible for the arrival of other south-western rarities on the same parts of the coast, and that they were shared by several other common species.

When Baird *et al.* wrote their paper there was no direct evidence for these reversed movements, but such evidence has since been obtained by Baird, Dr. W. H. Drury Jr. and the writer, both from radar studies and from moon-watching (Drury *et al.* 1961 and in press). The exact weather factors responsible for the reversal of migration have not yet been investigated, however. Reversed movements in spring have commonly been attributed to low temperatures (Lack 1960c), so it is possible that high temperatures might be important in autumn. However, Baird *et al.* (1959) quoted a case of reversed migration in *cold* south-west wind, which suggests that wind direction might also be important.

SOUTH-EASTERN VAGRANTS IN SCOTLAND

A new hypothesis

In many ways the migration of the Red-breasted Flycatcher in Europe is an exact parallel to that of the Yellow-breasted Chat in North America. Both species occur in surprising numbers in autumn in areas far outside their breeding-ranges, in directions exactly opposite to their normal directions of migration. I therefore propose the hypothesis that the two phenomena arise in the same way: that in certain weather conditions the Red-breasted Flycatchers and Barred Warblers reverse their orientation, and that some individuals then overshoot the north-west limit of their breeding-ranges, eventually reaching the east coast of the British Isles.

This hypothesis differs from that of Williamson (1959) in two important ways. First, it supposes that the birds do not orient downwind, but in a direction opposite to that of their normal migration. Second, it supposes that this autumn movement does not take place in the weather that is normally associated with the birds' southward migration, but in conditions which are in some ways more typical of spring. (In these respects the hypothesis links with the conclusion reached by

Vleugel in 1947 that some birds perform movements in the direction of spring migration during the winter, following earlier movements induced by hard weather.) By analogy with the case of the Yellow-breasted Chat, we may expect reversal of migration of Barred Warblers and Red-breasted Flycatchers to be correlated either with high temperature, or with south-east wind, or with both.

In the remainder of this paper I will attempt to test this hypothesis by comparing the observed arrivals of south-eastern vagrants at Fair Isle with records of wind and temperature on the Continent. On the hypothesis of north-west orientation, the most likely area for the birds to have taken off would be north or east Germany.

Bird records used

I have used the data on which Lack (1960b) based his analysis of migration at Fair Isle. (These records were originally made at the Fair Isle Bird Observatory, were supplied by P. Davis and K. Williamson and are now filed at the Edward Grey Institute, Oxford.) My analysis, unlike Lack's, is confined to the period 1950-59, since weather data for 1948 and 1949 were not available. The way in which the data have been extracted was explained by Lack (1960a and b): it will suffice to comment here that only increases in numbers were used as evidence of new arrivals. A few genuine arrivals may thus have been overlooked at times when there were many birds on the island, but this is preferable to the possibility of including a few spurious records.

Weather records used

Weather data have been taken from the maps in the British *Daily Weather Report* for 1800 hours GMT, the time at which the birds reaching Fair Isle during the course of the following day are most likely to have started their migration. The data refer to two areas: (i) north-west Germany and south-west Denmark, the sector where the birds are most likely to have left the Continental coast; (ii) south-east Germany (about 51°N, 14°E), some 800 miles south-east of Fair Isle (i.e. about the furthest point from which birds could reach it in 20 hours' flying unless exceptionally favoured by following winds).

The temperature records were selected from the nearest weather stations on the map to the above areas (usually Blåvandshuk in Denmark and Prague in Czechoslovakia, though other stations near-by were used when these were omitted from the map). The observed temperatures in each area on each day during 10th August-20th October were averaged over the ten-year period 1950-59, and the averages plotted as smooth curves to give the mean temperature in each area on each date in the autumn. The figures used in the analysis are the deviations of the observed temperature from the mean for the date concerned.

The wind direction used was that of the geostrophic wind—i.e. parallel to the isobars, except in a few cases near fronts where strong atmospheric convergence was to be expected. In most cases the geostrophic wind is a better approximation to the wind at the heights where birds migrate than that actually observed at ground level (Lack 1960a, b and d). The wind strength recorded was that of the surface wind at the nearest meteorological station marked on the weather map.

The wind data were used in two ways: (1) wind direction *per se*, as in Table 2; and (2) an "index of favourability", devised for Table 1. For the latter purpose, winds from ESE, SE or SSE were scored as 2, winds from E or S as 1, winds from W or N as −1, winds from WNW, NW or NNW as −2. This figure was multiplied by one for winds of (Beaufort) force 1 or 2, by two for winds of force 3 or 4, by three for winds of force 5 or 6, and by four for winds of force 7 or 8. Thus strong tail winds were given high positive scores, strong head winds high negative scores.

Occasionally interpolations were made for missing data, and local anomalies in weather were smoothed out, using records from neighbouring weather stations. Since the exact choice of data from the weather map was sometimes subjective, I was careful not to examine the bird records until after the weather data for every day in the ten-year period had been extracted.

Limitations of the data

As Lack (1960a and b) pointed out, we cannot expect to find an exact relationship between the records of the birds at Fair Isle and the weather at a few arbitrarily selected stations. A few of the birds may have arrived one or two days before they were first recorded. Also, at times when the wind in the North Sea is very light, it is conceivable that some birds might not reach Fair Isle until the second day after they take off from central Europe. On some days the weather at the selected stations may not have been representative of that in the areas where the birds took off. Moreover, before 1956 the *Daily Weather Report* was not plotted systematically, and it was not always possible to use records from the same stations on successive days.

For all these reasons, a statistical type of analysis is necessary: we can consider only the average values of the weather factors on the days preceding the arrivals of the birds. It is expected that any errors will average out when the data are combined—i.e. that they will not introduce any spurious correlations between the records of birds and weather. In particular, the errors are likely to be more or less the same for every species, so that any differences that may be found between different species can certainly be regarded as significant.

Redetermined migration

Williamson (1961b) has suggested that some south-eastern vagrants may reach Fair Isle, not directly from the breeding-areas, but on redetermined migration* after reaching Shetland or Faroe. If such birds should be included in the analysis, they would reduce the correlation between the arrivals and the weather in Germany, and hence it is desirable to try to detect them.

One prediction from Williamson's hypothesis is that redetermined migrants should usually arrive a few days after birds which arrive direct from the Continent. To test this prediction, I separated the records of Barred Warblers which reached Fair Isle one, two or three days after an earlier arrival, from the records five or more days after the most recent arrival. However, the differences between the two groups of birds (in their association with weather in Germany) were very small, and were not nearly significant statistically.

A second attempt was based on the intuitive idea that movements direct from the Continent should usually involve more birds than redetermined movements. Hence I separated the arrivals of two or more birds from those of single birds, but again I found no significant differences. I conclude that redetermined migration cannot be detected by these methods (though this is not, of course, evidence against Williamson's hypothesis).

Another prediction, more general than Williamson's, is that birds which arrive late in the season are less likely to come direct from central Europe than those early in the season, since they may include birds which have remained "off-passage" for some time in north-west Europe. To test this, I separated the latest 20% of the records of Barred Warblers (those after 12th September) from the first 80%. While the earlier records were associated (as described later in the paper) with temperature in Germany, the late records were not, the difference being statistically significant (see APPENDIX on page 86). In the case of the Red-breasted Flycatcher the difference was even greater, but because of the small number of records it was not quite statistically significant.

For the reason made clear in the last paragraph, I have omitted the latest 20% of the records of each species from the rest of the analysis.

RESULTS

The average values of the temperature deviation and the index of wind favourability in the two areas on the Continent on the evenings preceding arrivals at Fair Isle are summarised in Table 1 for the Barred

*It may be mentioned that redetermined migration was invoked by Baird *et al.* (1959) to account for some of the occurrences of Yellow-breasted Chats in New England, and that direct evidence for it has since been obtained (Bagg and Emery 1960).

TABLE 1—TEMPERATURES AND WINDS IN GERMANY ON THE EVENINGS PRECEDING THE ARRIVALS OF VARIOUS SPECIES AT FAIR ISLE

The data tabulated are the average values of the temperature deviation from the daily averag and the index of wind favourability (defined on page 78), for two areas in Germany on t evenings preceding the arrivals of various species at Fair Isle during 1950-59. The actual figu are the mean and the standard error. The top line gives the average values of the weather fact throughout the whole period from 10th August to 20th October during 1950-59. The li "Scandinavian migrants" refers to days when more than 30 small night-migrants of the spec considered by Lack (1960b) arrived at Fair Isle. In the case of the other species, the latest 20 of the records have been excluded from the analysis (see page 79)

	Number of birds	North-west Germany Temperature deviation (°F)	North-west Germany Index of wind favourability	South-east Germany Temperature deviation (°F)	South-east Germany Index of wi favourabili
Average (720 days)		0.00 ± 0.14	−0.59 ± 0.09	0.00 ± 0.18	−0.19 ± 0.06
Barred Warbler (*Sylvia nisoria*)	57	1.34 ± 0.66	−0.14 ± 0.34	1.40 ± 0.84	0.11 ± 0.20
Red-breasted Flycatcher (*Muscicapa parva*)	21	2.43 ± 0.54	1.05 ± 0.37	1.58 ± 1.11	0.76 ± 0.30
Scandinavian migrants (43 large waves)		0.33 ± 0.60	0.91 ± 0.38	0.39 ± 0.78	0.50 ± 0.31
Lesser Whitethroat (*Sylvia curruca*)	56	0.55 ± 0.53	0.16 ± 0.26	−0.07 ± 0.97	−0.12 ± 0.19
Wood Warbler (*Phylloscopus sibilatrix*)	11	0.18 ± 0.41	0.91 ± 0.87	2.82 ± 2.04	0.73 ± 0.41
Spotted Flycatcher (*Muscicapa striata*)	67	0.19 ± 0.30	1.72 ± 0.24	1.01 ± 0.54	−0.10 ± 0.19
Red-backed Shrike (*Lanius cristatus*)	17	1.76 ± 1.12	0.82 ± 0.57	0.88 ± 2.01	0.35 ± 0.47
Scarlet Grosbeak (*Carpodacus erythrinus*)	14	−2.28 ± 0.83	−2.71 ± 0.67	−4.07 ± 0.89	−1.00 ± 0.31
Yellow-browed Warbler (*Phylloscopus inornatus*)	21	−0.19 ± 0.68	−0.86 ± 0.74	−1.00 ± 1.06	−0.43 ± 0.45

Warbler, the Red-breasted Flycatcher and certain other species. Table 2 gives the percentage frequency of the arrivals corresponding to various wind-directions on the Continent. Also included in the tables are the average values of the wind index and the percentage frequency of various wind directions throughout the whole period from 10th August to 20th October in the ten years 1950-59. The negative average values of the wind index indicate that, on average, north and west winds tend to be more frequent and stronger than south and east winds.

Barred Warblers and Red-breasted Flycatchers

Table 1 shows that both the Barred Warbler and the Red-breasted

LE 2—ARRIVALS OF VARIOUS SPECIES AT FAIR ISLE, GROUPED ACCORDING TO THE WIND-DIRECTION IN GERMANY ON THE PRECEDING EVENINGS

centages have been rounded to the nearest whole number and so the figures on any one line do not necessarily total exactly 100

	Calm or force 1	Force 2 or stronger								Number of birds
		NE or ENE	E or ESE	SE or SSE	S or SSW	SW or WSW	W or WNW	NW or NNW	N or NNE	
	%	%	%	%	%	%	%	%	%	
west Germany										
e (720 days)	21	2	4	11	8	18	19	12	4	
Warbler										
nisoria)	24	2	2	23	11	11	14	9	5	57
easted Flycatcher										
pa parva)	10	–	–	38	24	10	–	5	14	21
navian migrants										
43 large waves)	5	5	14	28	16	9	12	7	5	
Grosbeak										
acus erythrinus)	14	–	7	–	–	–	14	21	43	14
-browed Warbler										
copus inornatus)	14	–	14	5	19	5	29	10	5	21
east Germany										
e (720 days)	52	2	4	7	4	8	15	7	1	
Warbler										
nisoria)	70	4	2	4	5	2	5	9	–	57
easted Flycatcher										
pa parva)	71	–	24	5	–	–	–	–	–	21
navian migrants										
43 large waves)	46	–	14	12	7	12	7	2	–	
Grosbeak										
acus erythrinus)	57	7	–	–	–	–	14	21	–	14
-browed Warbler										
copus inornatus)	43	–	19	–	–	5	29	5	–	21

Flycatcher tend to arrive at Fair Isle on days after warm evenings in Germany. The average temperature deviations are between 1.3 and 2.5 degrees Fahrenheit, and are statistically significant (see APPENDIX). This is exactly the prediction of the reversed migration hypothesis.

The correlations with wind are more complicated. The arrivals of Red-breasted Flycatchers are strongly correlated with "favourable" winds, but those of the Barred Warbler are not, although they tend to occur when winds are less "unfavourable" than average (Table 1).

Both species tend to occur much more often after nights of SE or SSE wind in north-west Germany than would be expected by chance (Table 2), but arrivals after winds between south and WSW are equally frequent in both species, and there is no correlation at all with SE winds in south-east Germany. Indeed, the arrivals of both species are significantly correlated with calm weather in south-east Germany. In conjunction with Lack's (1960b) finding that only 27% of the Barred Warblers and only 40% of the Red-breasted Flycatchers are associated with SE winds in the northern part of the North Sea, these facts make it extremely unlikely that wind-direction could be the major cause of the arrivals. Instead, they seem to be primarily associated with the western parts of central European anticyclones, which cause calm weather in central Europe and light southerly winds on the North Sea coast.

For this reason, we cannot immediately accept that the correlation with high temperature is significant, since it might merely result from the primary correlation with anticyclonic weather. To eliminate this possibility, we must compare the records of the south-eastern vagrants with those of common Scandinavian species, whose autumn emigration is also known to be associated with anticyclonic weather (Nisbet 1957a, Lack 1960a and b).

Scandinavian migrants

In Tables 1 and 2 I have summarised the weather associated with the large "falls" of the commoner Scandinavian species at Fair Isle. Table 1 shows that these arrivals are only slightly correlated with high temperatures in Germany, the difference from those of the Red-breasted Flycatcher being statistically significant. This confirms Lack's conclusion that the arrivals of the Scandinavian species take place in different weather from those of the south-eastern vagrants. In fact, the southward migration of the Scandinavian species is known to be correlated with falling temperatures (Nisbet 1957a and b). Hence the difference seems to be that the migration of the Scandinavian species takes place mainly in the cool (northern and eastern) parts of anticyclones, whereas that of the south-eastern vagrants is associated with the warm (southern and western) quadrants.

Tables 1 and 2 show that the falls of Scandinavian migrants at Fair Isle are quite well correlated with SE winds in north-west Germany (more so than those of the Barred Warbler), but they are more strongly correlated with SE winds in the northern North Sea (Lack 1960b). This is consistent with Lack's suggestion that the birds are drifted westwards from Norway.

In an attempt to find evidence for reversed migration in other species, I have also analysed the weather associated with the records of four other species which breed in Scandinavia and migrate more or

less south-east in autumn: the Lesser Whitethroat (*Sylvia curruca*), the Wood Warbler (*Phylloscopus sibilatrix*), the Spotted Flycatcher (*Muscicapa striata*) and the Red-backed Shrike (*Lanius cristatus*). Table 1 shows some differences between these species and the commoner Scandinavian migrants, but they are not statistically significant.

Scarlet Grosbeaks and Yellow-browed Warblers

Two other eastern species, the Scarlet Grosbeak (*Carpodacus erythrinus*) and the Yellow-browed Warbler (*Phylloscopus inornatus*), also occur at Fair Isle with inexplicable regularity, so I have analysed their records in the same way as those of the Barred Warbler and Red-breasted Flycatcher. Table 1 and 2 show that the arrivals of Scarlet Grosbeaks at Fair Isle are very strongly associated with low temperatures and northerly winds in Germany; the arrivals of Yellow-browed Warblers are similar, but the correlation is much less marked (and is not statistically significant). Peter Davis (*in litt.*) informs me that Scarlet Grosbeaks usually arrive at Fair Isle in north-easterly winds, and data given by Williamson (1961a) show that the same applied to the Yellow-browed Warbler in 1960, although this was not so in earlier years (Lack 1960b). These facts suggest that the arrivals of most Scarlet Grosbeaks, and some Yellow-browed Warblers, are associated with depressions centred over southern Scandinavia; in turn, this suggests that the birds reach Fair Isle after flying westwards around the north side of the depressions, across central Sweden and Norway. The same explanation was given by Nisbet (1957a and b) for the arrivals of Yellow-browed Warblers at Fair Isle in 1955, and of other eastern species at Fair Isle and Utsira (west Norway) in 1954. This suggestion needs further investigation.

DISCUSSION

Although the results obtained in this paper were exactly those predicted from the hypothesis of reversed migration, they do not, of course, prove that reversed movements actually occur. It is therefore worth while to consider their relevance to other theories of the occurrence of south-eastern vagrants at Fair Isle.

1. The fact that the arrivals of south-eastern vagrants are correlated with high temperatures in Germany, whereas the big falls of Scandinavian species are not, supports Lack's (1960a and b) conclusion that the two groups of birds come from different areas. Presumably, therefore, the occasions on which both groups of species arrive at Fair Isle simultaneously (Williamson 1959, 1961a, etc.) should be regarded as coincidences. Such coincidences may arise in two ways: (a) the south-east winds which drift Scandinavian birds to Fair Isle are favourable for "overshooting" by birds on reversed migration in Germany; and (b) some south-eastern vagrants may reach Norway

early in the autumn, and later depart southwards on redetermined migration, only to be drifted south-west to Fair Isle in company with a wave of Scandinavian species.

2. The fact that the arrivals of south-eastern vagrants at Fair Isle are not strongly correlated with south-east winds, either in Germany (this paper), or in the North Sea (Lack 1960b), or at Fair Isle (Lack 1961), strongly opposes any theory based on drift or downwind orientation. Such a theory could now be maintained only if it be supposed also that the great *majority* of the birds reach Fair Isle on redetermined migration from areas to the west or north. This supposition, however, is inconsistent with the strong observed correlation between the arrivals and the weather in Germany.

3. There remain only two possible explanations of the phenomenon: (a) random dispersal, in which some individuals fly in all directions; and (b) a definite north-westward orientation. At present the main reason for preferring the latter hypothesis is the analogy with the case of the Yellow-breasted Chat, in which reversed movements are definitely known to coincide with high temperatures. Lack (1961) has recently observed reversed movements over the southern part of the North Sea in autumn.

It is now possible to formulate my hypothesis of reversed migration more fully. In certain weather conditions, Barred Warblers and Red-breasted Flycatchers tend to reverse their orientation and set off north-westwards from Germany and/or central Europe; so far as is known, this behaviour is confined largely to juveniles (Williamson 1959). The weather factor most closely associated with the reversal of orientation seems to be high temperature, but in the case of the Barred Warbler calm (anticyclonic) weather may also be important. If conditions *en route* are favourable (in particular if the winds are southerly or south-easterly) some individuals continue over the North Sea, and some may reach Fair Isle during the course of the following day. The most favourable circumstances for birds to reach Fair Isle are those in which they take off on the south-west side of an east European anticyclone; at times when the high extends into Scandinavia the birds may reach Fair Isle on a south-east wind, with a fall of Scandinavian drift-migrants; at other times they arrive in westerly winds associated with lows to the north or west. Especially late in the season, some birds also arrive at Fair Isle on redetermined migration after earlier wandering to the British Isles, Faroe or Norway: these birds often arrive in west or north-west winds.

It is hoped that this paper will stimulate field-observers to seek direct evidence for autumn movements oriented to the north-west, either by radar in the North Sea area, or by moon-watching in eastern Europe.

SUMMARY

(1) Arrivals of Barred Warblers (*Sylvia nisoria*) and Red-breasted Flycatchers (*Muscicapa parva*) at Fair Isle are associated with high temperatures and with light winds from the south-west or south-east in Germany, but are not strongly correlated with south-east winds in the North Sea. In these respects they are significantly different from those of the commoner Scandinavian migrants.

(2) It is suggested that in warm weather juvenile Barred Warblers and Red-breasted Flycatchers are liable to reverse their orientation from south-east to north-west in central Europe, and that if the winds are favourable they may then overshoot the north-western limit of their breeding-range and reach areas far to the north-west. Analogous reversed movements are known in North America in the Yellow-breasted Chat (*Icteria virens*) and other species.

(3) Arrivals of the Scarlet Grosbeak (*Carpodacus erythrinus*), and perhaps the Yellow-browed Warbler (*Phylloscopus inornatus*), at Fair Isle are correlated with north or north-east winds in the North Sea, and with low temperatures in Germany. It is suggested that these species usually reach Great Britain around the north side of lows centred in south Scandinavia.

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Appendix—Statistical analysis of results

The figures in Tables 1 and 2 have been analysed by standard statistical tests, assuming the weather variables to be normally distributed. "One-tail" tests were used for the Barred Warbler and Red-breasted Flycatcher, since the hypothesis of reversed migration gave a specific prediction of the type of association with wind and temperature, but "two-tail" tests were used for the other species. The following results were obtained:

Barred Warbler. Significantly associated with high temperature in NW Germany ($p<0.05$), with SE/SSE winds in NW Germany ($p<0.005$) and with calm weather in SE Germany ($p<0.02$). In these respects the early records were significantly different from the late records ($p<0.05$).

Red-breasted Flycatcher. Significantly associated with high temperature in NW Germany ($p<0.001$), with favourable winds ($p<0.001$ for NW Germany and $p<0.005$ for SE Germany), and with SE/SSE winds in NW Germany ($p<0.001$).

Neither the Barred Warbler nor the Red-breasted Flycatcher was significantly associated with high temperature in SE Germany, but the association was significant when the two species were considered together ($p<0.05$).

Scandinavian migrants. Significantly associated with favourable winds in NW Germany ($p<0.001$) and with SE/SSE winds there ($p<0.005$). Significantly different from Barred Warbler in association with calm weather ($p<0.01$ for both areas). Significantly different from Red-breasted Flycatcher in association with temperature in NW Germany ($p<0.05$).

Lesser Whitethroat, Wood Warbler, Spotted Flycatcher and Red-backed Shrike. Not significantly different from common Scandinavian migrants in any respect.

Scarlet Grosbeak. Significantly associated with temperature in both NW and SE Germany ($p<0.02$ and $p<0.001$ respectively). Significantly associated with wind index in both NW and SE Germany ($p<0.01$ and $p<0.05$ respectively). Significantly different in these respects from all the other species considered except the Yellow-browed Warbler.

Yellow-browed Warbler. Intermediate in all respects between the Scarlet Grosbeak and the common Scandinavian migrants, but not significantly different from either.

Notes

British-ringed Manx Shearwater recovered in Australia.—The Bird Ringing Committee of the British Trust for Ornithology has received a letter dated 22nd November 1961, which reports that the feathers and bones of a sea-bird "black or dark on top with white under-parts" have been found on a beach near Venus Bay (33°10′S, 134°28′E) in South Australia. The bird bore a B.T.O. ring, number

2205.7768, which showed that it was a Manx Shearwater (*Procellaria puffinus*) ringed as a chick on Skokholm, Pembrokeshire, on 9th September 1960. Since the first record of a British-ringed Manx Shearwater in South America in 1951 (*Brit. Birds,* 45: 346), seventeen of these birds have been recovered on the coasts of Brazil and Argentina between latitudes 18°S and 37°S, the majority in the second half of October or in November. If the bird under discussion reached Australia from these South American wintering grounds, an east-about journey across the South Atlantic and Indian Oceans would seem the easier, though longer, route, for westerlies prevail throughout the year south of latitude 40°S.

This is apparently the first record of the Manx Shearwater in Australia, although one cannot preclude the possibility that the bird died at sea and drifted as a corpse for the last stage of its journey. It is also the first recovery of a British-ringed bird in that continent.

ROBERT SPENCER

Spotted Redshanks up-ending to catch Sticklebacks.—J. H. Taverner has recently recorded the habit of Spotted Redshanks (*Tringa erythropus*) up-ending to feed (*Brit. Birds,* 54: 403-404). I saw similar behaviour on the marshes at Shotton, Flintshire, on several occasions in late September and October 1961. Parties of eight to 22 Spotted Redshanks were habitually feeding by swimming in the deeper pools and up-ending in the manner of ducks. The food taken was identified as Sticklebacks (*Gasterosteus aculeatus*). These fish were brought to the surface and swallowed with some difficulty, the birds often opening their bills and jerking their necks for several minutes. Even then the outline of a large Stickleback was sometimes visible in a bird's neck for a considerable while.

R. J. RAINES

Barn Owl apparently killing Weasel.—The note by T. J. Lawes on the killing of Weasels (*Mustela nivalis*) by Short-eared Owls (*Asio flammeus*) (*Brit. Birds,* 54: 326-327) prompts me to write of the remains of a Weasel which I discovered in a barn at Corpusty, Norfolk, on 14th August 1961. Only the hind parts of the animal—half of the trunk, the hind legs and the tail—were to be seen and these were lying near several pellets ejected by a Barn Owl (*Tyto alba*) which regularly inhabits this particular building. It would seem, therefore, that Weasels are occasionally taken as food by Barn Owls, although there is no mention of this in *The Handbook.*

J. M. LAST

Passerines feeding on blackberries.—With reference to the recent notes on birds eating berries (*Brit. Birds,* 54: 122, 124-125, 405), it may be of interest that I have personally recorded 24 species feeding on blackberries (*Rubus fruticosus*) at Dungeness, Kent, during the autumns

of 1960 and 1961. Both grounded migrants and local populations make use of the ready supply of food in the expanses of bramble on the shingle there. The birds concerned have been:

Wren (*Troglodytes troglodytes*)
Mistle Thrush (*Turdus viscivorus*)
*Ring Ousel (*Turdus torquatus*)
Song Thrush (*Turdus philomelos*)
Redwing (*Turdus musicus*)
*Blackbird (*Turdus merula*)
Wheatear (*Oenanthe oenanthe*)
Stonechat (*Saxicola torquata*)
Whinchat (*Saxicola rubetra*)
Redstart (*Phoenicurus phoenicurus*)
Nightingale (*Luscinia megarhynchos*)
Bluethroat (*Cyanosylvia svecica*)
*Robin (*Erithacus rubecula*)
Sedge Warbler (*Acrocephalus schoenobaenus*)
Blackcap (*Sylvia atricapilla*)
Barred Warbler (*Sylvia nisoria*)
*Garden Warbler (*Sylvia borin*)
Whitethroat (*Sylvia communis*)
*Lesser Whitethroat (*Sylvia curruca*)
Willow Warbler (*Phylloscopus trochilus*)
Chiffchaff (*Phylloscopus collybita*)
Spotted Flycatcher (*Muscicapa striata*)
Pied Flycatcher (*Muscicapa hypoleuca*)
*Bullfinch (*Pyrrhula pyrrhula*)

*Blackberry-eating mentioned in *The Handbook*

When one is handling birds for ringing, it is comparatively simple to establish if they have recently fed on blackberries. Juice stains are often present on the plumage and an examination of the bill and inside the mouth usually shows traces of the fruit. The colour of the droppings of trapped birds is also a clear indication of the presence of blackberries in the diet, as the stains on many ringers' clothes will show!

R. E. Scott

Pre-coital display of Magpies.—In view of the scarcity of published accounts of the pre-coital displays of the Magpie (*Pica pica*), the following notes seem worth recording. The species is quite common in Totley and other well-wooded suburbs of Sheffield, Yorkshire, and a pair which I watched in the spring of 1961 were renovating an old nest in a garden near mine. At 7.20 a.m. on 27th April, when they had been engaged in this work for several days, the birds were feeding together on a patch of bare earth. After a few minutes one of them, presumed to be the female, adopted a position in which its body and tail were flattened to the ground, its head was slightly raised and its wings, held half-open and drooping, were quivering rapidly; it should be emphasised that only the wings, and not the tail, were quivering. This posture and the associated movement seemed to combine elements of begging and soliciting displays. The other bird, presumably the male, was about three feet away at the time but turned and began to approach the female. He hopped towards her with his tail held sideways at an angle to his head and body and slightly raised, and at the same time vibrated his open wings, which were held stiffly out from his body. The last action was so rapid that the white areas on his wings appeared blurred and, from my view-point in front of and above him, presented a very striking effect. After two or three hops in this position he mounted the female from behind and coition occurred

briefly. When the birds parted the female hopped a short distance away, apparently feeding, and then flew up to the nest which was about seventy yards away. The whole sequence of events lasted rather less than two minutes. Unfortunately, I watched the first part of the display through a closed window and if the birds called the sounds were inaudible to me, but during the last stages they were definitely silent.

D. Goodwin, in his paper on the displays of the Magpie (*Brit. Birds,* 45: 113-122), mentioned wing-flirting and fluttering as being used by birds of either sex towards their mates, but not in terms of a soliciting display by the female, nor do any of his descriptions convey as high a degree of intensity as that of the male in my observations. Both he and F. J. Stubbs (*Brit. Birds,* 3: 334-336) referred to the effective show of white in the plumage of displaying Magpies and this was the most impressive part of the events which I observed. T. M. CLEGG

Notes on the food of the Marsh Tit.—The following notes on the food of the Marsh Tit (*Parus palustris*) seem worth placing on record. At Perham Down, Hampshire, I observed this species eating seeds of the spear thistle (*Cirsium vulgare*) and upright hedge-parsley (*Torilis japonica*) in August 1949, and those of the lesser burdock (*Arctium minus*) on 9th October 1949. At Waterford, Hertfordshire, I saw a single bird eating berries of the hawthorn (*Crataegus monogyna*) on 9th October 1955, and at Little Berkhamsted, Hertfordshire, I watched one consume several seeds from the pods of a spindle tree (*Euonymus europaeus*) on 29th October 1961; this plant is poisonous. Ernest Blezard (*Trans. Carlisle Nat. Hist. Soc.,* 8: 83) found nutlets of the alder (*Alnus glutinosa*) in the stomach of a male killed at Kentmere, Westmorland, on 17th December 1935, and regular feeding on the fallen fruit of a French pear (*Pyrus communis*) has also been recorded in autumn (*Brit. Birds,* 44: 109).

It will be noted that all the above records refer to the autumn or winter months. During the breeding season the species is probably mainly insectivorous. For example, on 13th May 1961, at Northaw, Hertfordshire, I spent 45 minutes watching a pair of Marsh Tits feeding young. Only insects were brought, the most numerous item being caterpillars of the Oak Leaf-roller Moth (*Tortrix viridana*), but Hymenoptera (Cynipoidea) and Diptera (Tipulidae and Asilidae) were also represented. BRYAN L. SAGE

Song Thrush incapacitated by seed heads.—There was a considerable influx of Song Thrushes (*Turdus philomelos*) and Blackbirds (*T. merula*) on Holy Island, Northumberland, during the night of 2nd/3rd October 1961. The following morning, while walking through the dunes, I came upon a Song Thrush which was unable to fly and, on

catching it, I found that its wings were "glued" to its body by a mass of the prickly seed heads of the alien *Acaena anserinifolia* which grows in abundance in the dunes. It could not, in fact, move its wings, but I managed to remove all the seed heads before I let it go.

The finding of a juvenile Wheatear (*Oenanthe oenanthe*) in a similar state was recorded in the *Ornithological Report for Northumberland & Durham for 1950*: 122, and James Lilburn, who resides on Holy Island, told me that Redwings (*T. musicus*) and duckling Shelduck (*Tadorna tadorna*) have been found dead with varying amounts of these seed-heads covering them. L. P. ALDER

[A number of records of birds trapped by the seed heads of burdocks (*Arctium*) and other plants were recently discussed in *British Birds* (54: 246) and a letter on a similar fate which befell a bat appears on page 96 in this issue.—EDS.]

Blackbird dead on nest after grass fire.—It was with considerable interest that I read the account by P. M. Hope and G. E. Pipe of a Whinchat's (*Saxicola rubetra*) nest surviving a grass fire (*Brit. Birds,* 54: 364), for it reminded me of a comparable occurrence at Corby, Northamptonshire, in April 1957 (unfortunately the exact date was not recorded). The fire took place in an area of coarse, dry grass dotted with hawthorn, blackthorn and bramble. Afterwards, in the remains of a small hawthorn four feet high, I found a Blackbird's (*Turdus merula*) nest with the female in the incubating position, but quite dead! The outside of the nest was partially burned, but the inside was unharmed and still contained four eggs which proved to be in an advanced stage of incubation. Not only does this illustrate the insulating qualities of the nest, but also the suicidal reluctance of the female to desert her eggs. N. L. HODSON

The field identification of Sardinian, Subalpine and Spectacled Warblers in autumn.—During the period 3rd-15th September 1961, while staying at Estartit on the Costa Brava, Spain, I had many opportunities to study numbers of Sardinian, Subalpine and Spectacled Warblers (*Sylvia melanocephala, cantillans* and *conspicillata*). All three species could be watched together as they fed in fig trees and they were, at times, joined by occasional Blackcaps (*S. atricapilla*), Garden Warblers (*S. borin*) and Whitethroats (*S. communis*). Even at this time of year the adult male Sardinian and Subalpine Warblers retain their distinctive features and are readily identifiable, but I. C. T. Nisbet and T. C. Smout (*Brit. Birds,* 50: 204) have implied that confusion is possible between some other plumages of these two species. My observations, on the other hand, lead me to the conclusion that this is extremely unlikely, the Sardinian Warbler in all states of autumn

llumage being most distinctive. As previously pointed out by J. J. wift (*Brit. Birds,* 52: 198), there is a greater danger of confusion etween the very similar first-winter Spectacled and Subalpine Warblers. Dr. Nisbet has very kindly read and commented upon the otes that follow. I wish to stress, however, that the conclusions are ntirely my own, for in several cases Dr. Nisbet's observations in outh-east Europe were at variance with them. It should be added hat I did my watching both in bright sunlight and in heavy clouded onditions, with × 10 binoculars.

ardinian Warbler. The adult females of this species have the appearance of dull- rown, plump female Whitethroats. I found that the best distinctions were the elatively longer tail, heavy bill, very distinctive rattling alarm-note and lack of ufous in the wings. All the immature birds that I saw had dark chocolate-brown pper-parts, very dark tails and dark grey under-parts with slightly paler throats. The bills of the immatures looked very heavy; their upper mandibles were wholly ark brown, and their lower mandibles black on the tip and underside and whitish t the base. The red eye-rings of the adult males were conspicuous even at long ange (up to forty yards); in the adult females the eye-rings were rufous, obvious looked for at medium ranges (up to twenty yards), and in immatures they were ufous-brown, inconspicuous and impossible to distinguish except at very close anges (less than five yards).

A point worth stressing is that both females and immatures *can look very large in the ield* and without direct comparison with another species this might be very mis- eading. They looked very dark and thick-set, as dark as Dartford Warblers (*S. undata*) and as thick-set as Barred Warblers (*S. nisoria*). In no way did they esemble Subalpine or Spectacled Warblers and I would suggest that any dark, eavy-looking, long-tailed "whitethroat" appearing in Britain in autumn should be xamined very carefully, the eye-ring of the adult female and the whitish wedge on he lower mandible of the immature being reasonable confirmatory field-characters.

ubalpine Warbler. This species appeared very much like a small Lesser White- hroat (*S. curruca*) without the dark ear-coverts, the soft grey of the crown and mantle and the sleek appearance contributing to this similarity. In flight the pale rey of the crown and mantle sometimes appeared tinged with green, but this effect as not apparent at rest. The under-parts of different individuals varied in shade om pink to creamy and the sides of the throat were generally whiter, but the moustached" effect was often very vague and difficult to distinguish, so much so hat I do not consider it a good field-character in immature birds.

All the Subalpine Warblers that I saw continuously held their tails cocked, even hen moving about in tree tops feeding, and this gave them a superficial resemblance o Red-breasted Flycatchers (*Muscicapa parva*)—a resemblance which was enhanced y the white under tail-coverts common to both species—and I feel that this is robably the best single feature for identification purposes. It should be added hat this habit did *not* give the bird an appearance similar to a Dartford Warbler. t no time was a reddish eye-ring noticeable in the field. The wings were wholly rown, though both primaries and secondaries were edged with paler brown. The ack of any rufous in the wing was the best method of separation from the Spectacled Warbler and the lack of dark ear-coverts would distinguish the Subalpine Warbler om the otherwise very similar Lesser Whitethroat.

pectacled Warbler. I found this species superficially similar to a Whitethroat, wing to the rufous in the wings, but at the same time I thought that it more closely

resembled a Lesser Whitethroat or a Subalpine Warbler. The crown and mantle were a delicate ashy-grey, much as those of the Subalpine and *the ear-coverts did not appear dark in young birds.* The white eye-ring was always noticeable and this, together with the pale grey head, made the dark eye very conspicuous. The under-parts were pale orange-buff and the throat whitish, not obviously different from some young Subalpine Warblers.

Spectacled Warblers were continuously on the move when feeding in trees, and in bushes they would flit ahead from bush to bush rather than skulk like a Whitethroat; this behaviour was closer to that of a *Phylloscopus* than a *Sylvia*. They had the same sleek appearance as Lesser Whitethroats, and "jizz" alone was sufficient to distinguish them from the "untidy-looking" Whitethroats.

To summarise. Female and first-winter Sardinian Warblers can seem very dark and heavy in the field. Immature Subalpine and Spectacled Warblers both look dainty, neat birds, somewhat resembling Lesser Whitethroats; the former is best distinguished by tail-cocking, lack of dark ear-coverts and wholly brown wings, the latter by behaviour, rufous in wings and white eye-rings. J. T. R. SHARROCK

Bonelli's Warbler in Co. Cork.—On 2nd September 1961, R. D. Jackson, T. Q. Green and N. M. D. Brown discovered an unusual *Phylloscopus* warbler in a garden in the Glen on Cape Clear Island, Co. Cork. They watched it at ranges down to six feet for about two hours, and were also joined by D. Turner, A. A. K. Lancaster, B. W. Edwards and P. G. R. Barbier. B.W.E. suggested that it might be a Bonelli's Warbler (*Ph. bonelli*), but some of the others were not satisfied that it was not a Northern Willow Warbler (*Ph. trochilus acredula*). The following morning, therefore, the bird was watched for a further three hours by the above seven observers and also by J. J. Hall. Eventually it was caught in a mist-net and identification as Bonelli's Warbler was confirmed. The following description was taken in the hand:

Upper-parts: head, nape and mantle pale greyish-green, shading to greenish-yellow on rump; superciliary faint, buffish, tinged yellow, extending from bill almost to nape; wings and tail as mantle, but slightly darker; tail feathers and primaries edged yellow, the latter forming a distinct yellowish patch on closed wing. *Under-parts:* throat to under tail-coverts silky white. *Soft parts:* upper mandible darkish horn, lower mandible light horn; eye dark brown, almost black; legs light greyish-brown. *Wing-formula:* 3rd primary longest, 4th slightly shorter, 2nd 5.5 mm. shorter than 3rd and equal to 6th-7th; 3rd, 4th and 5th emarginated. *Measurements:* wing 63 mm., tarsus 21 mm., tail 54 mm.

The yellowish rump was inconspicuous even in flight and was, in fact, noticed by only two of the seven observers on the 2nd. The pale greyish-green upper-parts, white under-parts and fairly conspicuous green or yellow edges to the primaries and tail feathers appeared to be the best field-characters. The bird occasionally indulged in fly-catching and hovered once.

The five days from 29th August to 2nd September 1961 produced

several other interesting birds on Cape Clear Island. There were arrivals of fourteen Spotted Flycatchers (*Muscicapa striata*) on the 29th and nine on the 31st, when six Pied Flycatchers (*M. hypoleuca*) also appeared. At least four Icterine Warblers (*Hippolais icterina*) and one Melodious Warbler (*H. polyglotta*) were present during the period, as well as a Reed Warbler (*A. scirpaceus*) and several Redstarts (*Phoenicurus phoenicurus*), Sedge Warblers (*A. schoenobaenus*), Whitethroats (*Sylvia communis*) and Yellow Wagtails (*Motacilla flava*). Rarities included a bird which was either a Greenish or an Arctic Warbler (*Ph. trochiloides* or *borealis*) on the 29th, a Lesser Whitethroat (*S. curruca*) on the 30th, and an Aquatic Warbler (*A. paludicola*) and an immature Rose-coloured Starling (*Sturnus roseus*) on the 31st; the last was seen again on 2nd and 8th September.

This is the first record of Bonelli's Warbler in Ireland and the eighth for the British Isles. J. T. R. SHARROCK

Reviews

Down the Long Wind (A Study of Bird Migration). By Garth Christian. Newnes, London, 1961. 240 pages; 31 plates; 23 maps. 21s.

Few branches of ornithology have made more rapid strides than the study of migration and every year now sees the publication of a dozen or more important papers. There is thus a need for a summary which is both comprehensive and up to date, and *Down the Long Wind* makes a commendable attempt to provide both these qualities. The author has culled from a wide field of literature, some of it not well known, and the book is likely to interest the general reader. For the more knowledgeable bird-watcher, however, it is less satisfactory, being somewhat superficial and containing rather too many minor errors of fact and too much speculation, although, to do justice, the speculation is always acknowledged as such.

The treatment is discursive and anecdotal. One chapter, for example, wanders from Eagle Clarke's visit to Eddystone and the Kentish Knock (where Jackdaw migration was observed) via Lorenz's study of peck order in Jackdaws to the autumnal disappearance of Jackdaws from the author's house. Personal observations, not always of a strictly relevant nature, alternate with summaries of scientific papers, poetry, and occasional flights of literary fancy. Thus, in dealing with the reaction of the unemployed marchers of the 1920's and 1930's to the Starling roosts in London, the author writes, "To the short, hardy and observant men from the industrial valleys, the starlings seemed strangely akin to the hosts of gulls crouching on the east coast cliffs." Even more unsettling to the student are the wise

old countrymen who put in an appearance from time to time, expressing profundities in broad dialect while the experts nod their heads in agreement.

The publishers, with the optimism of their kind, speak of a "brilliant study", but the book is more properly classified in the genre "countryside literature", and as such should be a success. ROBERT SPENCER

The New Wildfowler. Edited by Noel M. Sedgwick, Peter Whitaker and Jeffery Harrison. Herbert Jenkins, London, 1961. 312 pages; 7 colour and 63 monochrome plates. 42s.

The editors' note to *The New Wildfowler*, which is published on behalf of the Wildfowlers' Association of Great Britain and Ireland, expresses the hope that this is "the most comprehensive book on wildfowling in all its aspects that has ever been achieved in this country". One cannot read the book through without feeling that this hope has been realised. Is there any comparable work in any other country, for that matter? But this is not only a book for those who would shoot wildfowl. There is also much of general interest. The chapter on shore-shooting, for example, includes comment on coastal vegetation, effects of tides and weather, and the habits of geese, ducks and waders. And the chapters on particular districts—the Fenland, the Broads—contain accounts of past and current usage, to which historians will wish to refer. Another section gives summaries of legislation dealing directly and indirectly with bird protection.

A main theme of the book is the conservation of wildfowl stocks throughout the country. To this end there are contributions by specialists on the migrations of British geese and ducks, foods, wildfowl rearing, keeping "ornamental" waterfowl, national refuges, local reserves, goose conservation, protection of birds, diseases of wildfowl, ringing, the wildfowl counts, and a valuable general survey of "conservation of wildfowl in Britain" by Gustav A. Swanson, the eminent American authority.

The plates include Roger Tory Peterson's pictures of swans, geese and ducks from the *Field Guide* and, combined with James M.Harrison's summary of identification characters and distribution, this section provides a key to all the wildfowl which are likely to occur in western Europe. There are some minor points on which one might quibble. For example, it is unduly pessimistic to say of the Grey Lag Goose that "a few pairs breed in Scotland"; in a later chapter there is a reference to "many broods of goslings" seen on Loch Druidibeg alone. But such instances are minutiae in a section which valuably condenses a surprising amount of information.

Throughout, the keynote is collaboration. If wildfowl are to be maintained, concerted action is essential. The success already achieved by the close co-operation of those who share an interest in

wildfowl, from every aspect, is impressively illustrated in *The New Wildfowler*. JOHN BERRY

Birds of River Tama. By Sakae Tamura. Seibundo-Shinkosha Publishing Company, Tokyo, 1961. 177 pages; 11 colour and 502 monochrome photographs. $20.

This book has both English and Japanese texts, but these are subsidiary to the photographs. It is, in fact, a picture story of the birds which breed on the banks of the Tama, the river which flows through Tokyo and Kawasaki. Like so many rivers which run through large towns, the Tama is subject to increasing pollution as the human population rises. Mr. Sakae Tamura's aim was to photograph what was left of the bird life before it vanished completely. The book opens with an aerial photograph of the river and a number of illustrations of the modern development along its banks. The main part is then devoted to a series of photographs of each of the chief breeding species. The number of different birds seems to be pitifully small, but Mr. Tamura has endeavoured to cover every one thoroughly. The Little Tern, for example, is shown hovering over the river and diving down to catch fish, incubating its eggs (four photographs illustrate the actual hatch), taking away the empty shells, feeding the young on fish, and so on right the way through its life until it migrates from the area. Among the other birds treated equally fully are the Little Ringed Plover, Kentish Plover, Long-billed Plover (*Charadrius placidus*), Fan-tailed Warbler, Skylark, Japanese Wagtail (*Motacilla grandis*) and Great Reed Warbler, while the Great Tit, Chinese Bamboo Partridge (*Bambusicola thoracica*) and Eastern Turtle Dove are also portrayed.

Thus, seven of the species concerned are familiar to us in Europe (while an eighth, the Eastern Turtle Dove, has occurred as a vagrant to Britain on three occasions) and it is useful to see illustrations of these in habitats on the other side of the world. There are also some interesting action shots, but by western standards the photography cannot be said to be good. Several of the pictures have been over-enlarged from the original 35 mm. negatives, with the result that definition has been lost and the grain has become obtrusive. Foregrounds tend to be badly out of focus because the photography has been from too low a viewpoint. The shots of the change-over at the nest of both Little Ringed and Long-billed Plovers should have been excluded, even though they are interesting, because in one case the foreground bird is completely out of focus and in the other there is a mass of blurred movement. The eleven colour plates are rather mixed and generally not a success. But, for all its photographic faults, this is a worth-while book because it illustrates the way in which the Japanese are now beginning to educate the new generation to a greater concern for the animal life of their country. ERIC HOSKING

Letters

What is a British bird?

Sirs,—The recent note and subsequent correspondence on the occurrence of a White-throated Sparrow (*Zonotrichia albicollis*) in Hampshire (*Brit. Birds,* 54: 366-367 and 439-440) prompts once more the question: what is a British bird? I do not oppose the decision to regard ship-assisted passage as a biological factor, but it seems to me difficult, if not impossible, to make distinctions about the "freedom" of such passage. What is the difference, for example, between a bird that lands on a ship of its own accord and is then fed by the passengers and one that is deliberately brought on board and subsequently released?

This leads me to what seems a far greater inconsistency—the recognition of records of odd birds that make the passage from America and the failure as yet to make honest Britons of established introductions like the Mandarin (*Aix galericulata*), Egyptian Goose (*Alopochen aegyptiacus*) and Amherst Pheasant (*Chrysolophus amherstiae*). Even though these occur only in restricted areas, their biological influence on the environment is much greater than that of the occasional American Passerine. Once a bird breeds regularly in a free state, surely it is realistic to accept it as a member of our fauna, whatever its origins?

BRUCE CAMPBELL

Animals trapped by plants

Sirs,—In view of the recent note and editorial comment on birds being trapped by plants (*Brit. Birds,* 54: 246), it seems relevant to suggest that small mammals may be open to similar dangers. On 25th August 1961, in my garden at Stolford, Somerset, I found a newly dead Pipistrelle Bat (*Pipistrellus pipistrellus*) with its left "wing" firmly held by the bristles of some rough bristle grass (*Setaria verticillata*). Probably it had caught on the grass head in flight, perhaps while after insects, as it is most unlikely that it would have attempted to settle there. It seems possible that the Sand Martin (*Riparia riparia*) described by M. Goodman (in the note referred to above) may have become entrapped in a similar way.

J. V. MORLEY

[Another note on a bird entangled with seed heads appears on pages 89-90 in this issue.—EDS.]

Request for information

Cold weather migrations.—The British Trust for Ornithology and *British Birds* are analysing the unusually impressive cold weather migrations of the week following 28th December 1961. All records of movements, arrivals and departures at this period are of interest, including times, species, numbers and directions (also weights of birds caught). Details should be sent to Kenneth Williamson, B.T.O., 2 King Edward Street, Oxford, by 28th February.

PLATE 18. Screaming party of Swifts (*Apus apus*), Glasgow, September. These noisy, dashing gatherings are a characteristic sight and sound of the colonies on warm summer evenings; they are thought to help to unify the group and they play a definite part in the preparation for migration (page 74). *Photo: C. J. Pennycuick*

Notice to Contributors

ritish Birds publishes material dealing with original observations on the birds of ritain and western Europe, or, where appropriate, on birds of this area as observed other parts of their range. Except for records of rarities, papers and notes are ormally accepted only on condition that the material is not being offered to any her journal. Photographs (glossy prints showing good contrast) and sketches are elcomed. Proofs of all contributions accepted are sent to authors before publica-on. **After publication 25 separates of papers are sent free to authors (two r more authors of one paper receive 15 copies each); additional copies, for hich a charge is made, can be provided if ordered when the proofs are turned.**

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Papers should be typewritten with double spacing, and on one side of the sheet lly. Shorter contributions, if not typed, must be clearly written and with similar acing. Failure to help in this way may result in delays to publication.

Notes should be worded as concisely as possible, and drawn up in the form in hich they will be printed, with signature in block capitals and the writer's address early written on the same sheet. If more than one note is submitted, each should on a separate sheet, with signature and address repeated. In the case of rarity cords, any supporting description which is too detailed for publication should be ached separately.

Certain conventions of style and layout are essential to preserve the uniformity any publication. Authors of papers in particular, especially of those containing stematic lists, reference lists, tables, etc., should consult the ones in this issue as a ide to general presentation. English names of species should have capital tials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed odwit), but group terms should not (e.g. warblers, godwits). English names are ose used in *The Handbook of British Birds*, with the exception of the changes listed in *ritish Birds* in January 1953 (46: 2-3). The scientific name of each species should given (in brackets and underlined) immediately after the first mention of the glish name. Subspecific names should not be used except where they are evant to the discussion. It is sometimes more convenient to list scientific mes in an appendix. Dates should take the form "1st January 1962" and no ner, except in tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or en "Jan. 1", whichever most suits the layout of the table concerned. It is rticularly requested that authors should pay attention to reference lists, which herwise cause much unnecessary work. These should take the following form:

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ITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits.* London. p. 34.

rious other conventions concerning references, including their use in the text, ould be noted by consulting examples in this issue.

Tables should be numbered with arabic numerals, and the title typed above in style used in this issue. The title and any headings within the table should t be underlined, because this sometimes makes it difficult for the editor to indicate type to be used. It is most important that the layout of each table should be efully planned with an eye to its final appearance; above all, it should be borne mind that tables must either fit into the width of a page, or be designed to fit a ole page lengthways. All tables should be self-explanatory.

Figures should be numbered with arabic numerals, and the captions typed on a arate sheet. All line-drawings should be in indian ink on good quality drawing per (not of an absorbent nature) or, where necessary, on graph paper, but this st be light blue or very pale grey. It is best if maps, graphs, etc., are drawn twice size of the final reproduction (ideally, therefore, for the normal 4″ width the ginal should be 8″ wide); sketches of birds, however, should be only slightly ger than the size at which it is intended they should appear. It is always most portant to consider how each drawing will fit into the page. The neat insertion lettering, numbers, arrows, etc., is perhaps the most difficult part of indian ink awing and, unless he has had considerable experience of this kind of work, an hor should seek the aid of a skilled draughtsman.

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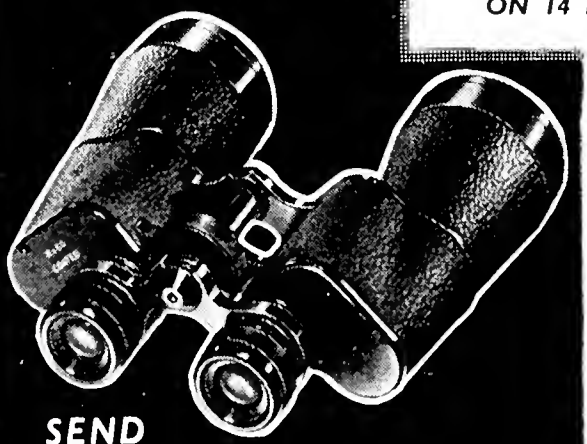

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British Birds

Vol. 55 No. 3

MARCH 1962

Weights from five hundred birds found dead on Skomer Island in January 1962*

By M. P. Harris

Department of Zoology, University College of Swansea

SKOMER, 722 ACRES, is the largest of the islands off the Pembrokeshire coast and one of the most westerly points in Wales. A visit was made there from 2nd to 5th January 1962, during one of the coldest spells of weather this country has experienced for many years. Large numbers of birds, which had apparently been forced out from the mainland by snow and ice, were trying to exist on the island, being either unwilling or unable to attempt the crossing to Ireland. The species concerned, and some indication of the numbers involved, are given in Table 1.

It was virtually impossible for these birds to obtain food or water, because the whole island was frozen hard, and many of them were

*Mr. Harris is to be congratulated on making the most of an interesting, if somewhat sad, opportunity. This paper was received soon after the event and we have published it as quickly as possible because, although complete in itself, it records an integral part of the impressive hard weather movements that took place in the cold spell at the turn of the year. We hope, therefore, that it will serve as a reminder of the proposed analysis already mentioned in the February issue (page 96). Apart from many sight records of large-scale migrations to the west and SSW (with a few to the east along the south coast), and records of colossal casualties in Ireland and on some coasts of England and Wales, there was also an interesting series of ringing recoveries from south-west England, Wales, Ireland, northern and western France and north Spain at this time. Anyone who has any relevant observations for the week or ten days beginning 28th December 1961, and has not yet submitted a summary, is asked to write to Kenneth Williamson, British Trust for Ornithology, 2 King Edward Street, Oxford, AS SOON AS POSSIBLE. Information required includes records (however fragmentary) of visible migration, with dates, times, species involved, numbers and directions; details of large-scale deaths; and any available weights of birds caught or found dead, with dates, times and localities.—EDS.

TABLE 1—NUMBERS OF BIRDS SEEN AND DEAD ON SKOMER ISLAND, PEMBROKESHIRE, 2ND-5TH JANUARY 1962

All figures in the "Maximum seen" column are estimates and not counts

	Maximum seen	Found dead	Remarks
Lapwing (*Vanellus vanellus*)	100	10	Many others very weak
Golden Plover (*Charadrius apricarius*)	2	1	
Snipe (*Gallinago gallinago*)	500	–	No sign of ill effects
Woodcock (*Scolopax rusticola*)	50+	–	No sign of ill effects
Curlew (*Numenius arquata*)	100	–	Some weak
Skylark (*Alauda arvensis*)	?	–	Many passing through
Wren (*Troglodytes troglodytes*)	?	10	Many had apparently left
Mistle Thrush (*Turdus viscivorus*)	15	6	
Fieldfare (*Turdus pilaris*)	1,000+	36	Many too weak to fly
Song Thrush (*Turdus philomelos*)	500+	18	
Redwing (*Turdus musicus*)	thousands	245	Many too weak to fly
Blackbird (*Turdus merula*)	1,000	3	
Stonechat (*Saxicola torquata*)	–	1	Large decrease from usual
Meadow Pipit (*Anthus pratensis*)	?	23	
Pied Wagtail (*Motacilla alba*)	–	1	
Starling (*Sturnus vulgaris*)	200	187	Movement made maximum inaccurate
Greenfinch (*Chloris chloris*)	–	4	
Goldfinch (*Carduelis carduelis*)	10	–	
Linnet (*Carduelis cannabina*)	–	2	
Chaffinch (*Fringilla coelebs*)	20	15	
Brambling (*Fringilla montifringilla*)	10	2	

dying from starvation or cold. A search of the boulders in North Haven, South Haven and The Wick, the three accessible beaches on the island, revealed 564 recently dead corpses, which are also recorded in Table 1; most of these had apparently died while roosting among the boulders. A few live birds were caught and ringed, but some of these were found dead within 24 hours, the actual numbers being 12 out of 24 Starlings (*Sturnus vulgaris*) ringed, five out of 22 Redwings (*Turdus musicus*) and three out of nine Song Thrushes (*T. philomelos*). Many other birds were killed by such predators as Buzzards (*Buteo buteo*), a Hen Harrier (*Circus cyaneus*), a Peregrine (*Falco peregrinus*), a Tawny Owl (*Strix aluco*), Ravens (*Corvus corax*) and Carrion Crows (*C. corone*). Kestrels (*F. tinnunculus*), which two weeks earlier had very frequently been seen on the island, had entirely deserted it, however, as had all the Stonechats (*Saxicola torquata*) (except for one found dead) and the majority of the Dunnocks (*Prunella modularis*) and Wrens (*Troglodytes troglodytes*).

The birds most commonly found dead were Redwings, Starlings, Fieldfares (*Turdus pilaris*), Meadow Pipits (*Anthus pratensis*), Song Thrushes, Chaffinches (*Fringilla coelebs*), Lapwings (*Vanellus vanellus*)

LE 2—SEXES AND WEIGHTS OF BIRDS FOUND DEAD ON SKOMER ISLAND, PEMBROKESHIRE, 2ND-5TH JANUARY 1962

nts are in grams. Weights of "normal" birds have been taken mainly from those quoted 1957), Browne and Browne (1956) and Williamson (1958), with the addition of some ed records. The figures in brackets show the numbers of birds on which the "normal" averages and ranges are based

	Sex	Total examined	Total weighed	Weight range	Average weight	"Normal" average	"Normal" range
us vanellus)	♂	3	2	136-145	140.5		
	♀	4	3	124-131	128	210 (1)	
	?	1	1		140		
	Total	8	6	124-145	134.2		
Plover							
drius apricarius)	♀	1	1		114		
dytes troglodytes)		10	5	5-8	6.4	9.2 (70)	7.4-11.7
nrush							
viscivorus)	♂	3	3	72-75	73		
	♀	2	2	62-68	65		
	Total	5	5	62-75	69.8	146 (1)	
pilaris)	♂	8	8	53-60	57.6		
	♀	20	17	53-66	58.5		
	?	1					
	Total	29	25	53-66	58.4		81-124
rush							
philomelos)	♂	3	2	41-43	42.0		
	♀	5	5	40-49	43.2		
	?	1	1		34		
	Total	9	8	34-49	41.8	73.5 (29)	63.0-82.7
musicus)	♂	70	55	33-44	37.8		
	♀	89	73	31-46	37.1		
	?	12	9	34-43	38.9		
	Total	171	137	31-46	37.8	65.5 (68)	
l							
merula)	♂	3	3	54-58	56.6	94.7 (34)	78.6-109.6
Pipit							
pratensis)		16	12	8-16	12.7	18.2 (800)	13.9-23.4
tail							
lla alba)	♂	1	1		14	21.5 (2)	20.6-22.4
vulgaris)	♂	54	52	36-61	52		
	♀	59	57	41-62	53		
	?	16	11	46-56	50	71.8 (38)	56.5-79.7
	Total	129	120	36-62	51.4		
h							
chloris)	♂	4	4	16-22	20.2	30.4 (5)	29-32
lis cannabina)	♂	2	2	13-14	13.5	18.2 (3)	16.4-20.0
la coelebs)	♂	1	1		13		
	♀	3	3	11-14	12.2		
	Total	4	4	11-14	12.5	22.4 (6)	18.6-26.0

TABLE 3—WING AND TAIL MEASUREMENTS OF MALE AND FEMALE REDWINGS (*Turdus musicus*) FOUND DEAD ON SKOMER ISLAND, PEMBROKESHIRE, 2ND-5TH JANUARY 1962

Wing length mm.	♂	♀	Tail length mm.	♂	♀
108		1	72		1
109			73		
110		2	74		
111		2	75		2
112	2	14	76	1	3
113		7	77	3	6
114	3	13	78	2	7
115	12	10	79	4	10
116	6	9	80	5	8
117	15	16	81	8	6
118	8	4	82	6	12
119	12	5	83	13	6
120	3	4	84	10	5
121	2	2	85	4	3
122	6		86	8	3
123			87	2	1
124	1		88	1	
			89		3
Total	70	89	Total	67	76
Mean	117.3	115.1	Mean	82	78.5

and Wrens. Other species which were present in large numbers but seemed to suffer little were Snipe (*Gallinago gallinago*), Woodcock (*Scolopax rusticola*), Curlew (*Numenius arquata*), Skylark (*Alauda arvensis*) and Blackbird (*T. merula*). As mentioned by Ash (1957), Blackbirds seem able to survive in hard weather and can presumably exploit food sources not available to the other thrushes.

All suitable corpses were weighed, measured, sexed by dissection and examined for helminth parasites. Most had small numbers of one or more trematodes, cestodes, nematodes or Acanthocephala, but the infestations did not seem high enough to cause any appreciable mortality.

Sexes and weights are summarised in Table 2 and the paragraphs which now follow discuss and amplify the data presented there.

Redwing

A total of 245 Redwings were found dead, but only 171 of these were in good enough condition to be examined in the laboratory. All but two were first-year birds and all but one were of the Continental form, *T. m. musicus*. The measurements of wing, tail, tarsus and bill were taken in most cases. Williamson (1958) has stated that there is

no evidence that the sexes differ in size, but Table 3 shows that the Skomer males had, on average, slightly longer wings and tails than the females. On the other hand, there were no appreciable differences in the bill and tarsus measurements. Similarly, the average death weights for 55 males (37.8 gm.) and 73 females (37.1 gm.) were very close. These weights agree well with those of Ash who gave 38.1 gm. for a single male and 37.2 gm. for the average of two females found dead in cold spells in 1954 and 1956. Williamson gave the average living weight of 68 migrants of this race on Fair Isle—birds which had, therefore, undertaken a long sea crossing and so lost much weight—as 65.5 gm. Two Redwings, race unknown, trapped on Skokholm (Browne and Browne 1956) weighed 77.5 gm. and 88.2 gm. Even taking Williamson's rather lower figure as the normal for birds on migration, it would appear that some of the Skomer Redwings had lost 50% of their weight.

Fieldfare

Of 36 Fieldfare corpses, 29 were examined, 28 dissected and 25 weighed. The sexing criteria put forward by Cornwallis and Smith (1960)—namely, that the crown and nape are grey in the male and grey suffused with olive-brown in the female—were critically applied and indicated 12 males to 16 females (with one indeterminate as it had been decapitated!). However, on dissection, six of the supposed males proved to be females and two of the females to be males, so that the true figures were eight males and 20 females. On the other hand, it is interesting to note that this 2:5 ratio is exactly the same as that given by Phillips (1961), who sexed 47 living Fieldfares by the characters given by Cornwallis and Smith. Ash found two males and nine females in a much smaller sample. Taken together, these counts begin to suggest that there may be a predominance of female Fieldfares in the British winter population.

The average weights of the eight males (57.6 gm.) and 17 of the females (58.5 gm.) on Skomer agree with Ash's figures and show a drop of nearly 50% when compared with those of Fair Isle birds (quoted by Ash), which ranged from 81 to 124 gm.

Starling

The Starling had the second highest total of individuals found dead and in proportion to the numbers present it suffered to a greater degree than did the Redwing. Of 129 corpses examined, 37 were adults and 92 were first-winter birds. Browne and Browne gave the average weight of eight adult Starlings as 80.2 gm. and of 32 first-winter birds as 70.3 gm. The corresponding death weights on Skomer were 74.8 gm. and 51.0 gm., indicating a loss of approximately 30% in each

case. The average weight of dead males was 52 gm., and of females 53 gm.

Song Thrush

Only nine out of 18 Song Thrush casualties were examined and the average death weight of eight was 41.8 gm. This is slightly over half the average weight of 29 Song Thrushes trapped on Skokholm (Browne and Browne). A Song Thrush killed by a car on the Pembrokeshire mainland on 7th January 1962 weighed 82.5 gm., so had apparently not suffered in the hard weather.

Meadow Pipit

The average weight of 800 Skokholm birds was 18.2 gm. (Browne and Browne). The average weight at death of 12 Skomer birds was 12.7 gm., a difference of 5.5 gm. or 30%. Loss of weight seems to be more serious in small birds. Browne and Browne gave an instance of a Willow Warbler (*Phylloscopus trochilus*) losing 17% of its weight in five and a half hours. Obviously, therefore, a small bird can reach its death weight very rapidly.

Other species

Insufficient numbers or lack of normal weights prevent any definite conclusions being drawn for the other species listed in Table 2. However, Wrens appear to have lost in the region of 30% of their normal weight, male Blackbirds 40%, Greenfinches (*Chloris chloris*) 33%, Linnets (*Carduelis cannabina*) 26%, Chaffinches (*Fringilla coelebs*) 44% and a Pied Wagtail (*Motacilla alba*) 35%.

It would seem from the death weights that larger birds, such as thrushes, can lose approximately 50% of their normal weights before dying, while the smaller birds may be able to lose only about 35%.

Sex ratio

Substantially more female than male Fieldfares and Redwings were found dead, while there were approximately equal numbers of each sex among the Starlings. The predominance of females in the two thrushes could have been a direct reflection of the populations concerned or a result of their being more susceptible than males to cold weather. It seems that the former explanation may well apply to the Fieldfare. On the other hand, in fasting experiments with the House Sparrow (*Passer domesticus*), Kendeigh (1945) showed that the survival time for females was shorter than the average for the species. The viability of the heterogametic sex (the female in birds) may be lowered by the action of semi-lethal recessives on the X chromosome (Haldane 1922).

ACKNOWLEDGEMENTS

I should like to thank G. Jones for assistance with the collection of the corpses, and B. L. James and L. C. Llewellyn who gave much help in the dissections.

SUMMARY

(1) 564 birds of 16 species included in Table 1 were found dead on Skomer Island, Pembrokeshire, during the cold weather of early January 1962 and some 380 of them were weighed, measured and sexed by dissection, as far as the state of the remains allowed. The weights of 333 birds are summarised in Table 2.

(2) The majority of the Redwings (*Turdus musicus*) found were first-winter birds of the race *T. m. musicus*. Males had slightly longer wings and tails than females.

(3) There were eight male and 20 female Fieldfares (*Turdus pilaris*). The colour of the head and nape is of limited use in sexing this species.

(4) The Starlings (*Sturnus vulgaris*) included 37 adult and 92 first-winter birds.

(5) It appears that birds of the size of thrushes (normal weight 65-150 gm.) can lose more than 50% of their body weight before death, while small Passerines may be able to lose only 35%.

(6) Substantially more female than male Fieldfares and Redwings were found. This may have been due to a lowering of the viability in the heterogametic sex, but in the case of the Fieldfares is more likely to have been the result of a predominance of females in the population.

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Mass mortality among European Common Terns in South Africa in April-May 1961

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THE COMMON TERN (*Sterna hirundo*) is a migrant to South Africa, occurring on the coasts from October to February, although some birds may remain throughout the year (McLachlan and Liversidge

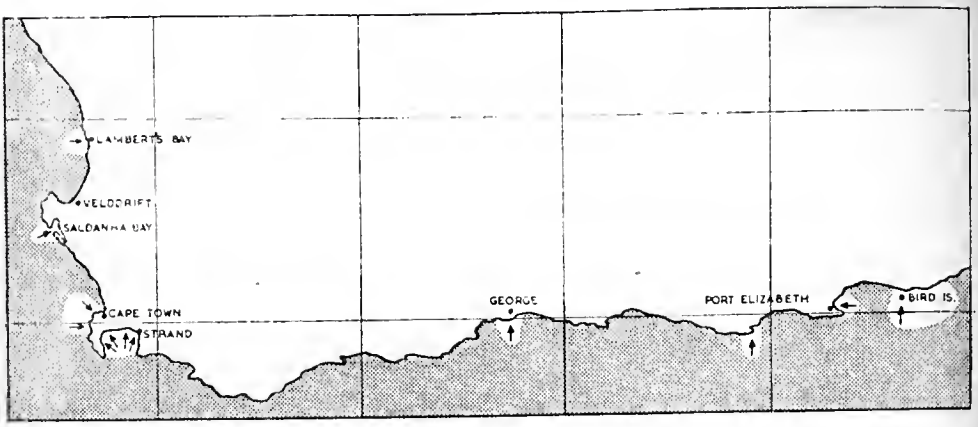

FIG. 1. The Cape, South Africa, with arrows to the areas where many Common Terns (*Sterna hirundo*) died in spring 1961. This map covers a width of some 600 miles

1957). In 1961, an unknown but apparently substantial proportion of the migrant population lingered long after the usual departure date and during April many became ill and died. High mortalities were observed at several localities from Port Elizabeth in the east to Lambert's Bay in the west (see Fig. 1) and the affliction may have been even more widespread.

In the investigation of this event, help was received from many quarters. For assistance in the laboratory and the field, I am indebted to Dr. G. J. Broekhuysen, J. G. R. MacLeod, J. Martin and Dr. J. M. Winterbottom. Other observations of dead and healthy birds were kindly made available by Mrs. M. Atkinson, Mrs. S. Barnard, A. R. Brown, M. Chaundy, Miss Krynauw, K. Krynauw, O. Lawson, Captain G. M. le Gras, R. Liversidge, Dr. Elsabie Malan, Miss L. Olivier, J. Rossow, Mrs. L. D. St Leger Searle and J. Spannenberg. Finally, in the search for the cause of the disaster fullest collaboration was accorded by Professor A. Kipps and Dr. W. Becker of the Virus Research Unit, University of Cape Town, and by Dr. J. K. Thompson and Dr. P. M. S. Masters of the Division of Veterinary Services.

FIELD OBSERVATIONS

Several of the field reports now available for tracing the onset and course of the mortality among the Common Terns were not submitted until some days or weeks after the observations were made. In consequence, the numbers of sick and dying birds and the dates on which they were seen were not always exactly known. It seems probable, however, that the first deaths in the south-western part of the Cape occurred during the second and third weeks of April. Some rather vague reports for this period are supported by two definite records of three dead terns at Fish Hoek in False Bay and two at Hout Bay on the Atlantic coast of the Cape Peninsula during the week

15th-21st April. However, it was not until the weekend of 22nd-23rd April that information from the Strand in False Bay brought indication of the extent of the mortality and more critical investigations were set in hand.

With the assistance of MacLeod and Martin, some four miles of the shore between the Strand and the mouth of the Eerste River were systematically quartered on three separate days—23rd, 25th and 26th April. The population of living terns along this stretch of beach was then estimated at 1,200-1,500, but numbers dwindled steadily during the ensuing weeks, either by exodus or death, until on 13th May there were less than fifty left. Apart from an occasional Sandwich Tern (*S. sandvicensis*), the birds were all Common Terns or Arctic Terns (*S. macrura*) and no Arctic were found amongst the dead.

On 26th April about half the living birds were in groups of ten to thirty at intervals along the water's edge. The rest were congregated at a shallow, slightly saline lagoon at the Eerste River mouth, which is a regular roosting site. About one-tenth of the living birds appeared to be ill. They were reluctant to fly when their companions took wing at our approach and they remained on the sand until we were within ten or twenty yards, then rose with evident difficulty and flew only a short distance at a time. Others were too sick to fly at all and were easily caught by hand. Several of the birds in this state had become separated from the flocks and were squatting singly on the dry sides of small dunes far from the water's edge. Most, however, were found at the river mouth, where the number of distressed and severely weakened terns was pathetic to see. The afflicted birds produced a copious fluid excrement.

Dead birds lay scattered over the whole four-mile stretch of beach between the dunes and high water mark. Approximately 150 corpses were buried or collected (for post-mortem examination) during the first three days' work; and, at intervals during the ensuing two weeks, Martin and MacLeod buried a further 320-odd. The total (469) thus amounted to 25-30% of the estimated living population at the outset of this work, but probably did not represent a full tally since the dead birds were not easily detected in the drifting sand and a number must have been overlooked. In addition, Black-backed Gulls (*Larus dominicanis*) and Cape Ravens (*Corvus albicollis*) were seen feeding upon the dead, while rodents, whose burrows were abundant amongst the dunes, probably shared the macabre feast. It was, however, my impression that scavengers were fewer and less active than might have been expected in the presence of so much food.

Another part of the False Bay coast where terns commonly congregate is the Zeekoevlei outlet near Strandfontein. From this locality, as from the Strand, "large numbers" of dead birds were

TABLE 1—EUROPEAN-RINGED COMMON TERNS (*Sterna hirundo*) RECOVERED IN SOUTH AFRICA IN APRIL-MAY 1961

Two relevant recoveries later in the year have also been included. With the possible exception of the three for which no data are yet available, all had been ringed as young variously classed as "pullus", "nestling" or "juvenile"; the first Finnish bird was described as "migrant young". The birds entered as "1st-winter" all had the dark carpal bar on the wing (page 108)

Country of origin	Ring no.	Place ringed	Date ringed	Date found	Place found	Finder	Plumage type	Approx. age at death
Sweden	YM2128	59°13′N, 15°31′E	27.6.57	23.4.61	Strand	J. Rossow J. Spannenberg K. Krynauw	"1st-winter"	46 months
Sweden	YS1724	59°28′N, 29°15′E	17.6.59	0.5.61	Strand	E. Crewe	—	24 months
Sweden	537102	58°13′N, 14°40′E	19.6.60	7.5.61	Strandfontein	A. R. Brown	—	10 months
Finland	A120565	61°32′N, 21°35′E	21.8.60	1.5.61	Strandfontein	Dr. P. M. S. Masters	"1st-winter"	8 months
Finland	A119807	60°12′N, 25°24′E	18.6.60	4.5.61	Strand	Mrs. S. Barnard	"1st-winter"	10 months
Finland	A130021	63°05′N, 27°35′E	6.7.60	4.5.61	Saldanha Bay	G. J. Broekhuysen	"1st-winter"	10 months
Finland	A102292	60°15′N, 21°50′E	27.6.59	4.5.61	Strand	J. G. R. MacLeod	—	23 months
Holland	?	(Makkunerwaard)	25.6.60	14.5.61	Gordon's Bay	Mrs. M. Atkinson	—	10 months
Heligoland*	7171708	— —	—	0.4.61	Lambert's Bay	Mr. Groenewald	—	—
Heligoland	7370958	53°39′N, 12°17′E	21.6.60	4.5.61	Gordon's Bay	O. Lawson	—	10 months
Heligoland	7323823	53°57′N, 8°26′E	17.7.59	9.5.61	Gordon's Bay	Mrs. A. Gentis	—	22 months
Heligoland	7284749	53°39′N, 12°17′E	6.6.60	22.4.61	Strand	J. G. R. MacLeod	"1st-winter"	10 months
Russia†	213156	— —	—	0.5.61	Strand	J. G. R. MacLeod	—	—
Russia†	F751400	— —	—	0.5.61	Strand	J. G. R. MacLeod	—	—
Finland	A124401	60°06′N, 25°04′E	28.6.60	15.6.61	Strand	—	—	12 months
Finland	A72792	60°21′N, 27°28′E	7.7.57	0.9.61	Walvis Bay	J. J. Rossouw	—	50 months

*Ringer has not yet submitted details to ringing station

†No reply yet received from ringing station

reported from 24th April onwards; and workmen engaged on canalising the vlei outlet thought that they had noticed the first casualties about the middle of the month. On 30th April Brown counted 80 corpses in one place at Strandfontein and 139 at a second. Many others were scattered in between and he estimated the total at 270 to 300 over a two-mile stretch of beach. In a smaller area, less than half a mile long, Winterbottom, Masters and I found approximately 1120 sick and dead birds on 1st May; and on 7th May Brown found a further 53 newly perished in the same locality. By 12th May, however, this part of the coastline was deserted, and no terns, alive or dead, were seen.

During the same period (24th April to 1st May) other casual reports were received of dead terns near George on the south coast, and at Sea Point on the peninsula. On 29th April Broekhuysen found five dead Common Terns at Langebaan, and one dead Common Tern and two dead Swift Terns (*S. bergii*) in a nesting colony of the latter at Meeuw Island in Saldanha Bay. In a neighbouring area, Velddrift on the Berg River, Chaundy found no evidence of any mortality on 13th May, but noted about 50 Common/Arctic Terns in apparent good health on the river estuary and shore.

Further north, at Lambert's Bay, Winterbottom and I made observations and enquiries during a visit on 23rd and 24th May. At that time, no signs of illness could be detected amongst an estimated 200-300 Common/Arctic Terns which were frequenting the shore; but the Harbour Master, who also acts as superintendent of the neighbouring guano island, reported that "at least 400" terns had died during the second half of April, chiefly on the island where they roost and to a lesser extent on mainland beaches.

In the Port Elizabeth area, Liversidge recorded mortality among Common Terns towards the end of April and during early May. He has kindly made available an interesting report from Captain le Gras, skipper of a fishing vessel, who noted dead terns in various fishing areas (5-10 miles off Cape St. Francis, off Slang Bay, and off Bird Island at about 34°S, 26°E) between 26th April and 10th May. Altogether about 40 corpses were observed floating on the water over a total area of 20-25 square miles. Le Gras added that "it is unusual to see any dead birds at sea, and the odd one found is a rare event". He also recorded a sick Common Tern which alighted on deck, refused to fly or eat, and died two days later "passing a green liquid from the vent".

RINGING RECOVERIES

This disaster resulted in 14 ringing recoveries as shown in Table 1, which also lists two further recoveries made later in the year. In the past, Common Terns bearing Finnish, Danish and German rings have

been found on South African shores (McLachlan and Liversidge 1957, Anon 1960, Nordström 1961), and the present records again suggest that the Baltic region and European North Sea coast supply the bulk of this migrant population. However, the two Russian returns, which have not yet been acknowledged by the ringing station, could refer to birds breeding anywhere in that country, more especially as a Common Tern ringed as a nestling in the Black Sea area in 1955 was recovered a year later at East London (Anon 1956). It is interesting that British-ringed Common Terns, which breed in the same latitudes as the Dutch and German birds, have never been found in South Africa, although the total of over 31,000 ringed in the United Kingdom up to the end of 1960 has resulted in 609 returns (1.95%), mainly from southern Europe and West Africa (Spencer 1961).

Writing of *S. hirundo* in the Americas, Austin (1942) stated that "of all the recoveries made on the wintering grounds eighty per cent at least are birds of the year". Most of the earlier recoveries of this species in South Africa and eight out of the thirteen returns for which data are available were also yearling birds. However, three were in their second year, one was in its fourth, and the last was in its fifth.

LABORATORY INVESTIGATIONS

Many of the dead birds seen in the field were damaged, severely dehydrated or decomposed, but about 130 specimens in fair to good condition were obtained between 23rd April and 1st May. Several of the freshest birds, including some which were found *in extremis* and destroyed, were reserved for bacteriological and virological tests, while the remainder (111) were examined in the laboratory at the Percy FitzPatrick Institute with the results recorded below.

(*a*) *Plumage*

Various authorities (Murphy 1936, Witherby *et al.* 1941, Peterson 1947) have indicated that dark lesser coverts, forming a distinct bar on the carpal joint of the wing, serve to distinguish Common Terns in their first winter from birds of greater age, although occasional individuals may retain some deep grey coverts well into adulthood (Cullen 1957). Seventy-eight of the 111 specimens in this series had the carpal bar. Most of these were probably yearlings and three ringed individuals certainly were. However, a fourth ringed bird with the dark shoulder mark had been marked in the nest in Sweden nearly four years before. The extent of the carpal bar was variable: about one-half of the specimens retained most or all of their dark coverts, but the rest were in various stages of replacing these with the paler grey feathers typical of adult summer plumage.

Most of the "first-winter" birds (those having the carpal bar) had white foreheads, but in four the feathers of this area were largely black. Among the 33 "adults" (those lacking the carpal bar), there were 15 with wholly black foreheads, eight with white foreheads and nine at an intermediate stage. The remaining two specimens were slightly damaged about the head so that the colour of the feathers could not be certainly determined.

Forty-five of the 78 specimens with dark carpal bar were completely white below, but the remainder of this group and all the "adults" had grey feathering from throat to vent, the tone varying individually from a pale wash to a much deeper shade with a warm mauve tinge.

In nearly all specimens (whether with or without shoulder patch), the first or second pairs of outer retrices, or both, were either missing or in process of development. The only exceptions were five birds in adult dress in which the tail moult was recently complete.

Most interesting was the state of the flight feathers. Of the 78 specimens with carpal bar, the primaries had been completely and recently renewed in ten (including the four-year-old bird mentioned above), more than half of the primaries had been replaced in 52, and less than half in 16; secondaries had been fully replaced in 61 and were in process of renewal in 17, all except one of these being birds in an early stage of primary moult. By contrast, in all 33 "adults" the wing moult was complete, but the feathers were fresh, showing no more signs of wear than did the new primaries and secondaries of birds in the "yearling" group. This was surprising, since, according to Witherby *et al.* (1941), the adults of British-breeding Common Terns replace their flight feathers in a post-nuptial moult which begins in July-August, but do not appear to moult their primaries or secondaries twice in one year. The "first-winter" birds, on the other hand, conformed to the statement by Witherby *et al.* that yearlings undergo their first complete moult in the February-June following their birth. Two possibilities thus exist: (i) that the entire series of specimens consisted of first-year birds, with the exception of the five ringed ones of known greater age; or (ii) that the moulting pattern in the populations reaching South Africa differs slightly from that in British birds.

(*c*) *Soft parts*

The colouring of the soft parts was recorded only for those specimens which had not suffered any noticeable dessication. Fifty birds with the dark carpal bar had wholly black bills, nine showed some red at the base of the lower mandible, and two had bills which were wholly red except at the tip. Five of those in adult dress had wholly black bills, five had bright red bills with black tips, and 13 showed a variable amount of red, mainly on the lower mandible.

Greater variation was observed in the colouring of the feet and legs of both "adults" and "first-winter" birds. For about half the fresh specimens, various shades of "dull", "dark" or "brownish" red were recorded, while the remainder ranged through orange-red, coral, true scarlet and bright crimson. These differences appeared to be purely individual and showed no correlation with the stage of moult.

(*c*) *Sex*

Because of internal decomposition, dehydration or damage, sex could not be certainly determined in 27 specimens. Of the remainder, 50 (including 13 "adults") were females and 34 (eight "adults") were males. In most the gonads were small to minute. However, six females in adult plumage and three in "first-winter" dress showed some signs of enlargement, with ovaries measuring 1-1.5 cm. along their longest axes and largest eggs 1-2 mm. in diameter.

It is interesting to note that 60% of the sample were females and three possible explanations exist: (i) that there is a similar disproportion in the sex ratio of the living population; (ii) that females were more susceptible to the destructive agent; or (iii) that the bulk of the males had already left on their northward journey when the malady struck. Cullen (1957) believed that males predominated on certain breeding grounds of the related Arctic Tern; and Lack (1954) has discussed the "general impression of the ornithologist . . . that male birds are rather commoner than females, which suggests that females have a heavier mortality". Thus, on general grounds, the first possibility seems less likely than the second. However, Lack thought that heavier mortality was attributable to such factors as predation of hen birds while incubating, rather than to any inherent weakness associated with the fact that, amongst birds, females are the heterogametic sex.

(*d*) *Weight*

Among 15 "adult" specimens judged sufficiently fresh to give reliable results, weights ranged from 76 gm. to 118 gm. and averaged 97.8 gm.; one of the lightest birds (77.2 gm.) was a male found alive and weighed a few hours before it died. Fifty-one "first-winter" birds ranged from 79 gm. to 115.5 gm. and averaged 100.2 gm.; seven of these which were taken alive had weights varying from 91.5 gm. to 114 gm. Szczepski and Kozlowski (1953), who provide the only weights of normal Common Terns that I can trace in the literature, gave a range of 101-175 gm. for adult birds. If it is assumed that the mean lies about half-way between these figures, then the present series averaged about 25% lighter than normal breeding birds.

(*e*) *Internal condition of afflicted birds*

The differences in weight between sick and healthy birds are rather smaller than might have been expected on the basis of post-mortem examinations, since all specimens in this series showed extreme emaciation. There was a marked wastage of the breast muscles and a complete absence of the subdermal fat deposits that are laid down by some long-distance migrants before their journey north.

Lungs, liver, kidney, spleen and heart appeared normal, but most specimens exhibited inflammation of the lower intestine. However, the most striking abnormality was a marked clouding of the airsacs and visceral mesenteries with a film of greyish-yellow exudate. According to Brandly (1959), a similar lesion is frequently observed in infections with pneumotropic strains of Newcastle Disease. Further similarities between Newcastle Disease and the present epizootic were the signs of prostration exhibited by afflicted birds and the existence of a profuse fluid diarrhoea. Similar symptoms were also observed by Beretzk (1959) in an epidemic which destroyed many hundreds of Mallards (*Anas platyrhynchos*) near Szeged, Hungary, in 1957.

(*f*) *Virological findings*

These will form the subject of a separate publication, but I am indebted to Professor Kipps for permission to mention here that a virus similar to, but not identical with, that of Newcastle Disease was isolated from the specimens supplied to his laboratory. Endeavours to identify this virus (which is lethal for domestic chicks) were at first unsuccessful, but it has recently been shown that it is neutralised by a serum prepared from a virus believed to have been responsible for an epidemic amongst Kittiwakes (*Rissa tridactyla*) in Scotland. Dr. Becker found that he could infect chicks experimentally by injection or, less successfully, by placing the virus in their drinking water. There was, however, no direct passage of the disease from infected birds to healthy companions; nor was it possible to induce illness in experimentally infected Swift Tern chicks.

On the basis of these observations, it seems possible that the infection may have been spread in nature as a result of the terns' habit of drinking and bathing at their roosting places, for which they usually seek out stretches of shallow stagnant water that rapidly become contaminated with their own excreta. These same stretches of water are generally frequented by numbers of sand plovers, notably the White-fronted (*Charadrius marginatus*); a special watch was kept for signs of illness amongst these birds, therefore, but none was detected.

DISCUSSION

The malady which overtook lingering or overwintering Common

Terns on southern Cape coasts during 1961 had several interesting features. Firstly, there was its sudden and virtually simultaneous onset in the third week of April at all points along the considerable stretch of coastline (approximately 1,000 miles) covered by the observations. Secondly, there was the equally abrupt cessation of mortality during the second week of May. From these two facts it would appear that the disease spread rapidly and ran a short course, killing or conferring immunity on all susceptible birds within a matter of days. Thirdly, the virus appears to have been curiously host-specific, producing illness in Common Terns and (probably) in the somewhat distantly related Kittiwake, but not in Arctic Terns, Swift Terns or White-fronted Sandplovers or the scavenging Black-backed Gulls and Cape Ravens. Fourthly, the disaster was remarkable for its severity, which may be judged from the fact that at least 1,300 birds are known to have died in four small areas alone.

Population studies indicate that, in normal circumstances, the average annual mortality among different bird species varies from about 20% to 60% (Lack 1954, Gibb 1961). However, despite the fact that such substantial numbers die, most do so unnoticed, as Captain le Gras remarked. Thus, although the full extent of the mortality in this disaster cannot be assessed, the number of dead birds counted suggests that it must have been very high indeed.

A basic question remains: what precipitated this spectacular epizootic? Patently, no infection generates spontaneously, but must always be present amongst the population to a greater or lesser degree. It is known, for instance, that Newcastle Disease in a mild or subclinical form may persist unrecognised amongst poultry flocks for years at a time (Brandly 1959). Because the clinical disease is most prevalent in autumn and winter it has been suggested (e.g. by F. R. Beaudette, see Brandly 1959) that obvious manifestations are provoked by cold or adverse weather.

In the present case, there is a suggestion (the Kittiwake disaster) that the virus responsible is endemic on the breeding and feeding grounds of various Charadriiformes in the northern hemisphere. It is thus not impossible that terns suffering subclinical infections may bring the virus south with them on their autumn migration. There was, however, a long interval between the October arrival of these birds in "winter" quarters and the onset of the disease nearly six months later.

In his discussion of the "pestes" or pandemic maladies which periodically overtake the guanays and other seafowl of the Humboldt current, Murphy (1936) pointed out that illness is most pronounced and mortality highest in years when abnormal oceanographic conditions prevail, more specifically when the warm equatorial current

"El Nino" displaces the colder waters normally washing the South American west coast. He suggested that, although various diseases, abnormal multiplication of endoparasites, etc., must play their part in these disasters, their ultimate source "lies in the change in the physical environment and a resultant malnutrition". Lovat was inclined to place a similar interpretation upon the results of the classic study of strongylosis in grouse (summary in Lack 1954); and the idea implicit in the suggestion by Beaudette, quoted above, is not very different. It amounts to this: a minor infection, present in subclinical form, may assume epidemic proportions with high mortality if the host population is under some form of stress. The same might occur if the causative agent itself underwent some mutation enhancing its virulence.

However, it was with the first possibility in mind that enquiries were set afoot regarding local marine and meteorological conditions during March and April 1961. In the first of these months phenomenal rains amounting to as much as five times the normal fell over the interior of the Cape, and the Weather Bureau (1961) stated that "as far as can be ascertained . . . such heavy precipitation simultaneously over such a large area of the Karoo (60,000 square miles) has never before been recorded". Good rains continued during April and flooded rivers carried large amounts of silt to the sea.

Regarding marine conditions, Messrs. de Jager and Rand of the Division of Fisheries kindly informed me that officers of their research vessels operating off the west coast noted nothing unusual. However, for evidence that some abnormalities did exist in the south I am indebted to E. Middlemiss, who left Cape Town on 21st April on a sea journey to Durban. On that date, between Cape Town and False Bay, he saw the most extensive areas of "red water" he has ever encountered. The patches were well-defined and, off Camps Bay to Blangkop, were hardly more than a few hundred yards apart. "Red water", which appears intermittently off Cape coasts, is produced by the excessive multiplication of a dinoflagellate, which is normally present in small numbers in the plankton. The organisms contain a highly poisonous alkaloid and various marine animals, such as fish and crawfish, have occasionally been recorded as dying in some numbers during these "blooms". The phenomenon is known from several parts of the world and its exact causation is not understood, but it is often associated with atypical meteorological conditions. The possibility thus exists that the outbreak of "red water" may have been directly associated with the illness in the terns, or it may have been the cause or result of other circumstances producing a food shortage and precipitating disease.

Unfortunately, these suggestions cannot be advanced in any but the most tentative form. They deal in phenomena which are little

understood and which have been hardly measured, if at all. Furthermore, the epizootic itself began and ended so abruptly as to leave no time for the development of adequate investigations before the disappearance (on migration?) of most of the surviving birds.

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Development of paddling and other movements in young Black-headed Gulls

By Miriam Rothschild

(Plate 19)

RECENTLY, in an interesting paper in this journal, Sparks (1961) discussed the relationship between foot-movements and feeding in shore birds. In view of his conclusions, it seems worth recording the age at which paddling and other movements were first performed by young Black-headed Gulls (*Larus ridibundus*) hatched in an incubator and reared in captivity (Rothschild 1936, 1940). Paddling takes the form of rapid "marking time": the bird changes its weight quickly from one foot to the other and keeps up the dance for 30 to 120 seconds. It then ceases abruptly, steps backward a pace, and glances sharply at

its feet. Usually it does not look downwards until its feet are stationary, but I have known cases where the bird has glanced down before it has actually stopped paddling.

Sooner or later all the birds hatched in the incubator showed this paddling behaviour. In most cases it started when they were 21 days old, but precocious chicks began at the age of 12 days. It is not known what particular external stimulus, if any, initiates the paddling *for the first time*. My gulls often first executed the movement on the bare ground. The behaviour appeared to arise spontaneously and I was quite unable to trigger it off in any bird which had not previously paddled—even, for example, by immersing its feet in cold or running water, or by giving it sight of water or worm-like objects. Once an individual had paddled, however, it could be stimulated to repeat the performance by the sensation of cold water round its feet or by the sight of a running stream. At about the age of three months, the paddling reaction was occasionally initiated by excitement at the appearance of a feeding dish; rarely it was also performed if the bird was frustrated, although it was not a usual form of displacement activity. As time wore on, and possibly because the movement was not rewarded by the finding of food, paddling gradually became less and less frequent among the captive gulls until, by the age of ten or twelve months, they were seen doing it only once or twice a month.

A bird blind from hatching also developed the complete paddling reaction at the usual age of three weeks. Even the backward step and downward jerk of the head at the cessation of the foot movement took place. The bird could see nothing, which showed that these last two actions were part of the same series of innate movements and were not developed as a result of the bringing of prey to view from the muddy or sandy substrate. They placed the bird in a favourable position in which to take advantage of such an occurrence.*

The sudden development from one day to another of innate pieces of behaviour, some of which consisted of a series or sequence of movements and were manifest *en bloc*, was a characteristic feature of these gulls hatched in incubators.

Thus the bathing movements were developed as a whole at an early age, only one phase being added at a later period. Up to the sixth day, the chicks merely stood still when placed in water. On the seventh day, a few reacted by defaecating and they also drank a few drops of the water. By the eighth day, almost all the chicks bathed

*In this connection, however, it is perhaps worth noting that chicks two to three days old could not feed properly if their eyes were covered. They "peeped" continuously and did not open their beaks even when touched with the feeding pipette, nor did they take any food. The moment their sight was restored they fed normally.

vigorously, going through all the typical movements (except the one) of the adults. This series of movements was also carried out by experienced birds if the bathing dish was empty. At the age of 27 days, a side-to-side "bathing roll" was added to the wing-flapping, head-ducking and up-and-down dipping of the body.

Three different types of wing-stretching were developed at different ages. The first stretch, when the wings are raised and arched over the back (plate 19a), occurred from the seventh day onwards. The second movement, in which the outstretched wing is supported on the outstretched leg (plate 19b), was first noted at the age of 20 days. The type illustrated in plate 19c, which is much less frequent and often accompanied by aggressive manifestations, was first developed at 40 days.

Adult sleeping attitudes were, on the contrary, gradually built up. As chicks, the gulls lay with their heads resting side to ground. After shedding their down and up to the age of four weeks, they still slept on the ground, lying on their breasts, but with their heads and beaks stretched out in front of them. At the age of four weeks, they began sleeping with their heads tucked under their wings, but still lying down. On the thirty-second day, a few started to sleep standing up and also began standing on one leg.

A small number of chicks made attempts to feed themselves on the third day after hatching, but none did so freely until the ninth day. Independent feeding was largely the result of trial and error or random pecking, and was not developed suddenly. The chicks were stimulated to peck at dark objects on a white ground or at small objects floating on their bathing water before they developed foot-paddling. At the age of 30 days the young gulls combined both pieces of behaviour and, after paddling, stepping back and looking down, they would peck at any floating object in the dish—not necessarily anything edible—and even at dark marks on the enamel bottom. Preening was basically an innate ritual, the chicks performing quite elaborate toilets on the first day of hatching; when the down was replaced by feathers and the wings developed, the preening became more complicated or specialised.

A worm-like object, such as a piece of string or bacon rind, the sudden appearance of a stream of running water from a tap or hose, or the sight of a newly-hatched chick, all released spontaneous and often frantic excitement in the young gulls. This was sufficient to override their normal behaviour and even temporarily obliterate the pecking order hierarchy or territorial inhibitions. A new experience, such as a flying insect in the vicinity or a large bird passing overhead, not only evoked intense interest but might trigger off an entirely "new" behaviour pattern which, up to then, had lain dormant.

RE 19. The development of wing-tches in young k-headed Gulls *rus ridibundus*). , the first stage wings raised arched over the k; this started at m days. Centre, second develop-nt with one out-tched wing sup-ed by a leg; this noted first at nty days. Bottom, third in order, n associated with er; this was seen forty days. The two wing-tches are used en the bird has n resting or ing, but the third y if wide awake ge 116) (*photos: iam Rothschild*)

PLATE 20A. Black-headed Gull (*Larus ridibundus*) lifting egg-shell to remove it. It holds the thin edge in its bill and either takes it away immediately or nibbles it for a while first. It has been shown that such shells near the nest increase the risk of predation (page 120).

PLATE 20B. Starting to roll an egg into the nest. This is an outsize model that has no connection with the experiments described on pages 120-129, but the action is typical. Bending over the egg, it rolls it back with the under-side of its bill (page 121) (*photos: N. Tinbergen*)

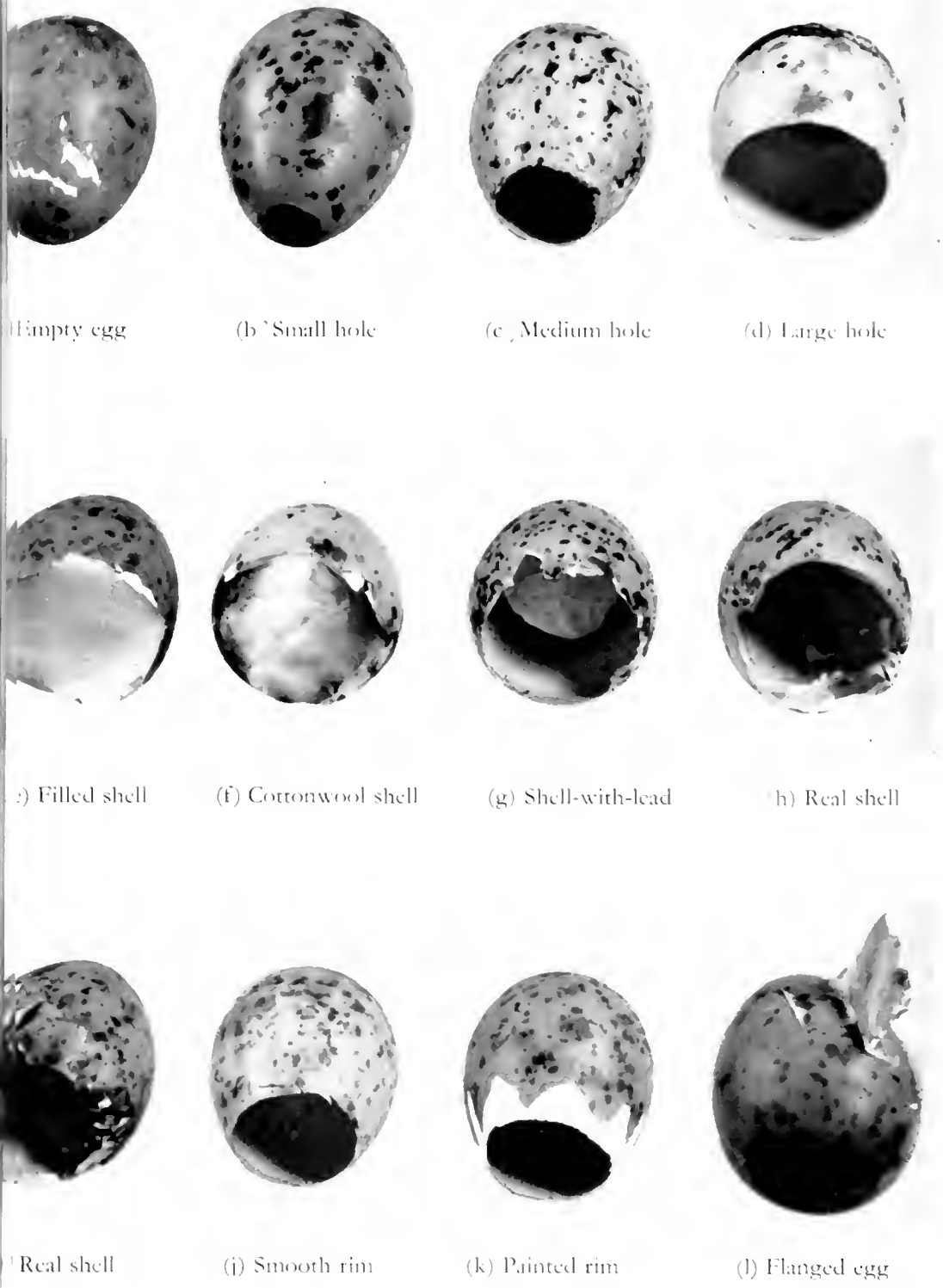

PLATE 21. Model eggs and egg-shells used in experiments with Black-headed Gulls (*Larus ridibundus*), Cumberland, 1961 (pages 120-129) (*photos: John Haywood*) ("Notched rim" is not shown)

PLATE 22. Scarlet Grosbeak (*Carpodacus erythrinus*), Finland, June 1958. A regular autumn vagrant to Shetland, it is otherwise rare in Britain. Females and young males, of which this is one, look identical and show no red. Note the dumpy shape, uniform plumage, round head, beady black eye and heavy conical bill; the wing-bars are more striking in autumn (pages 130–131) (*photo: Lars Hasking*)

It is obvious, from these few notes, that it is in fact extremely difficult and time-consuming to attempt to sort out the innate or learned components of any complicated piece of behaviour, such as foot-paddling, by observations made on wild birds.

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Foot-paddling in gulls

By N. Tinbergen

I SHOULD LIKE to supplement the interesting comments recently made by Sparks (1961) on the functions of foot-paddling in gulls, since more is known about it than is apparent from his article. In my book *The Herring Gull's World* (1953), where I referred to the excellent description given by Walker (1949), I reported that at least one population of Herring Gulls (*Larus argentatus*) applies this movement on a large scale, and succeeds in making earthworms crawl out on to the surface where they are then eaten as they appear. Earthworms are, in fact, a major item in the diet of the colony concerned. I also took issue with the opinion of Portielje (1928) who claimed that Herring Gulls paddle on the seashore and, in doing so, bring the marine worms *Arenicola marina* and *Echiurus pallasii* to the surface. I doubted the correctness of this, firstly because when I saw Herring Gulls paddle on the shore they did it in shallow pools and secondly because I believed that no worm of the inter-tidal zone reacts to mechanical disturbance of the soil by moving up; if anything, such worms withdraw. I argued that the peculiar response of at least some earthworms* of rising to the surface when the ground is vibrated may be effective against their main predator, the Mole (*Talpa europaea*). I finally pointed out that Black-headed Gulls (*L. ridibundus*) also select shallow pools when paddling on the seashore, and I suggested that the function in this context was the whirling up of small animals lying on or in the mud, thus making them visible. This was also the opinion of my brother, L. Tinbergen, who described in detail (1951) how Black-headed Gulls apply paddling systematically in shallow water

*Professor G. P. Wells informed me that, while earthworms of the genus *Allolobophora* have this response, he believed that the common lawn-worms (*Lumbricus*) do not.

on the tidal flats of the Frisian Sea in Holland; their foot movements whirl up the sand and mud, thus exposing *Hydrobia, Corophium,* small *Nereis, Scoloplos* and, above all, masses of "small tube-dwelling worms". The sand settles a little in front of the bird's feet, so that the paddling results in the formation of two V-shaped pits with a kind of delta in front of each V (such marks were illustrated by Swennen and van der Baan 1959, plate 7). While paddling, the gulls look down and now and then pick up small objects in front of their feet. Sparks's observations seem to tally well with this account. A relevant case of this type of paddling by a Herring Gull was reported to me by J. Peterson. He saw an immature Herring Gull on the quay at Lerwick, Shetland, paddle in a pool which was entirely black and opaque from coal dust suspended in it. On the bottom of this puddle were numerous grains spilt during unloading, and as these appeared at the surface, whirled up by the bird's trampling, they were neatly picked up.

We have, therefore, direct evidence of two functions of foot-paddling. First, Herring Gulls, and also Common Gulls (*L. canus*), practise it consistently on meadows, and actually catch earthworms in large masses with this method. Black-headed Gulls do not seem to apply paddling at all when catching earthworms (which, for instance, those at Ravenglass, Cumberland, eat by the thousand); as far as I have seen, they collect them when they are brought up by the plough. Second, Herring Gulls, Common Gulls and, to a much greater extent, Black-headed Gulls apply it in shallow water where it obviously serves to whirl up an invisible prey. It is worth adding that many other birds have this foot-paddling: Portielje (1927) mentioned it of adult Woodcock (*Scolopax rusticola*), Flamingo (*Phoenicopterus ruber*), Shelduck (*Tadorna tadorna*), Bar-headed Goose (*Anser indicus*), and several herons (Ardeidae); and Heinroth (1911) listed several species of duck and swan which do it in shallow water.

Foot-paddling seems often to occur, even in adult birds, as a rather automatic and "stupid" response to a wet substrate; Heinroth mentioned that one of his swans started to paddle in a film of water covering the ice on one of the ponds of the Berlin Zoo.

The ontogeny of paddling seems to be very much like that of many other species-specific behaviour patterns in birds. Miss Rothschild's interesting observations elsewhere in this issue (pages 114-117), which show that it appears at a certain relatively constant age in entirely inexperienced Black-headed Gulls, correspond to those of Portielje (1927) on young Mallards (*Anas platyrhynchos*) and of Heinroth on young Woodcock. Miss Rothschild's report that a blind young gull began to perform the entire sequence of paddling and "looking down" demonstrates beautifully how independent of experience the movement is when it first appears.

All the writers mentioned agree that, in young birds, paddling can be elicited in a great variety of situations, though most observations concern wet substrates (the feel or even the sight of water); however, Portielje saw young Herring Gulls paddle on dry sand, and Miss Rothschild noted that her young Black-headed Gulls did it when they saw a worm.

When we compare these aspects with the fact that Miss Rothschild's gulls gradually reduced the amount of paddling as they grew up, and with the facts mentioned above about the dual function of paddling in adult birds, it seems very likely that, while the response is innate and, at first, spontaneous, it can soon be elicited by a wide array of stimuli. It then becomes increasingly selective as the birds grow up and learn not to apply it where they have not been rewarded, and to restrict it to situations in which it does lead to the discovery of food. In addition, experienced birds have learned to go to the habitats where they can apply the method successfully, whereas young birds seem to do it merely when they stumble upon wet spots.

Why Black-headed Gulls do not hunt earthworms by paddling remains a puzzle; it is just possible that they are not heavy enough.

Another unsolved question is to what extent, and with which animals, gulls are successful by producing the "quicksand effect" on a wet beach, discussed by Sparks. Two of my correspondents, R. Stanier and Dr. J. Verwey, have told me that pressing or trampling on wet sand, which produces semi-liquid quicksand, makes animals such as young Cockles (*Cardium edule*), which are lighter than this "liquid", come to the surface passively. Mr. Stanier told me that in Morecambe Bay, Lancashire, fishermen occasionally collect Cockles by trampling on one spot until a small pool is formed in which the Cockles float to the surface. It seems possible that this is a third context in which paddling might often be rewarding.

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How do Black-headed Gulls distinguish between eggs and egg-shells?

*By N. Tinbergen, H. Kruuk, M. Paillette, and R. Stamm**

(Plates 20-21)

INTRODUCTION

BLACK-HEADED GULLS (*Larus ridibundus*) remove the empty egg-shell shortly after the hatching of the chick. An investigation into the survival value of this response and of the stimuli eliciting it (Tinbergen *et al.* 1962a) yielded the following results. An empty egg-shell at a distance of four inches from a single egg laid out in the dunes rendered such an egg more vulnerable to predation by Carrion Crows (*Corvus corone*) and Herring Gulls (*L. argentatus*); this suggests that egg-shell removal may help to reduce predation. The response can be elicited throughout the incubation period by a variety of objects in the nest or on its rim, in fact by "any object which does not resemble an egg, a chick, or nest material", although the egg-shell itself is optimal. In systematically conducted tests with dummies, it was found that colour, shape, size and distance between nest and shell affected the response.

These results suggested, therefore, that this seemingly trivial response, which normally takes no more than twenty seconds of a bird's time each year, contributes to the survival of the brood; and they showed that it is controlled by a complicated and well-adapted mechanism.

This first study, while not allowing us to list all the characteristics of the situation which elicits egg-shell removal, showed that the birds distinguish between egg-shell and nest material by at least four characteristics: in fact, the egg-shell is distinguished by being three-dimensional, rounded, less oblong than nest material, and partly white.

The present paper deals with the question of how gulls distinguish between egg-shells and eggs. Failure to do so would naturally

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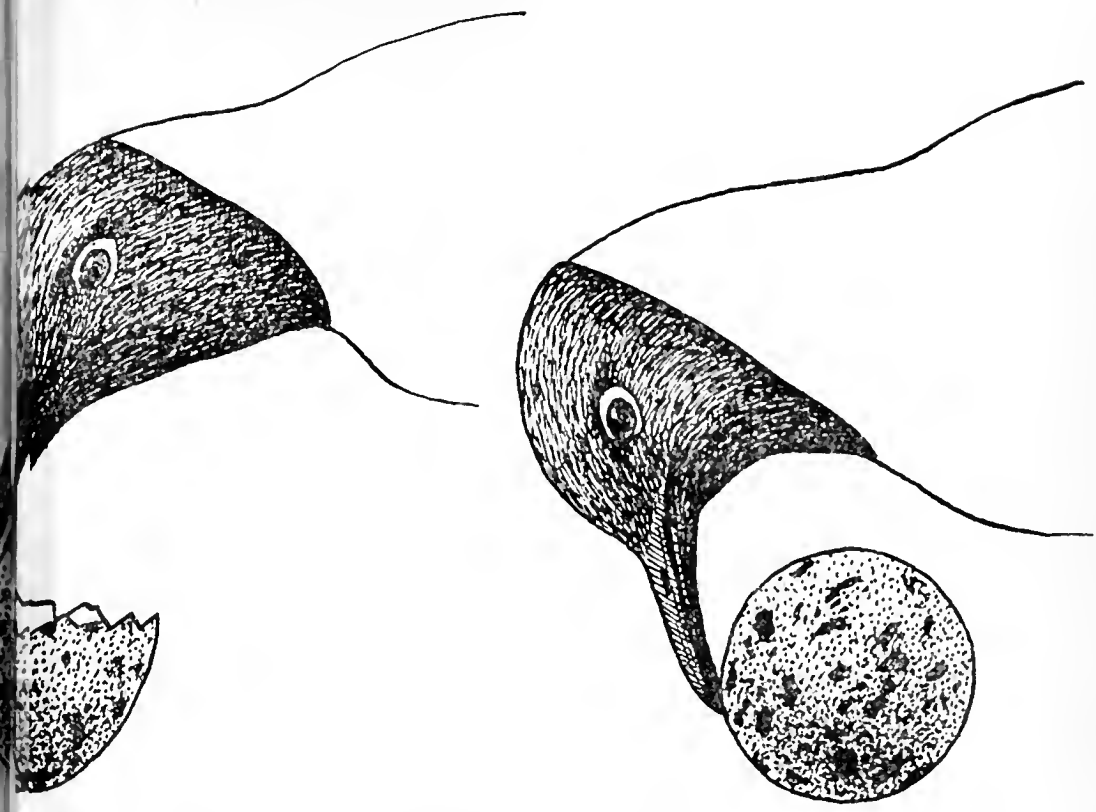

FIG. 1. The first stages of egg-shell removal (*left*) and egg retrieving (*right*) in the Black-headed Gull (*Larus ridibundus*) (see below) (*sketches: N. Tinbergen*)

endanger the brood, and we have actually never observed a gull removing its eggs or chicks.

Although an intact egg and an egg-shell as left after the chick has hatched have much in common, they elicit two entirely different sets of responses. An egg in the nest is brooded and occasionally shifted. If an egg happens to lie on the nest's rim or even a little outside the nest, the bird often retrieves it. It may either sit down first or remain standing in the nest, then may gently touch the egg's upper or distal surface with the ventral side of its bill. This is then often followed by "rolling in", which is done by bending over the egg and balancing it against the under surface of the lower mandible, then rolling it back towards the breast, i.e. into the nest cup (plate 20b).

A shell in or near the nest is taken in the bill (plate 20a). The bird gets hold of the thin edge and either walks or flies away with it at once, or nibbles it for a while before removing it. Nibbling may be interrupted when the bird drops the shell, but it ultimately leads to "carrying". Sometimes a gull pecks at the material which is left behind in the shell and it may eat some of it.

The situations eliciting the two responses in our experiments were the same except for the objects (egg and egg-shell) themselves.

The differences we see between an egg and an egg-shell could be described in various ways, and the following descriptions guided us in our attempts to find out to which properties the gulls reacted:

	Egg	*Egg-shell*
(1)	Smooth, oval outline	Interrupted, partly serrated outline
(2)	Closed; no opening	With opening; hollow
(3)	No thin edge or rim	A thin edge
(4)	Heavy (*c.* 37 gm.)	Light (*c.* 2 gm.)
(5)	Dotted khaki; no white	White on rim and inside
(6)	Total egg-coloured surface	Small egg-coloured surface

Of these, all except (4) could be perceived visually. Since both responses are initiated by visual stimuli (the birds focusing the objects from a distance, irrespective of the direction of the wind, and visually similar dummies being effective), weight could not play a part in the release of the response, but it might have an effect once the bird has made contact.

METHOD

This study was carried out at the Black-headed Gull colony at Ravenglass, Cumberland, in the summer of 1961. Various models, to be described later, were presented, one at a time, on the rims of nests containing two or three eggs, and the birds' responses were observed from hides approximately eight feet away. Each bird was given each model only once; and each was tested with all models of a series. The sequence of presentation was varied at the different nests, as much as possible according to a latin square arrangement. Each individual test lasted either 15 minutes or—if a bird completely performed one of the two end-acts (rolling-in or carrying) before the 15 minutes were over—until either end-act had been completed. After each test, the observer signalled to an outside helper without disturbing the bird. The helper then approached, inevitably forcing the bird to fly up, and as quickly as possible prepared the next test situation. With each nest the models compared were always put out in the same place.

We could usually distinguish the two partners of a pair and were able, therefore, to test individual birds. However, because we could not control the moment of nest-relief, some series had to be broken off before the relieved bird had been tested with the entire series of models. The number of presentations varies slightly in each experiment, therefore.

The following terms were used to characterise the birds' behaviour:

Billing: touching the model's surface with the bill, which is usually closed (this generally precedes rolling)

Intention-rolling: bending the neck over the model and touching its distal surface without actually moving it
Rolling: pushing the model in the direction of the nest cup, irrespective of success
Lifting: picking up the model, then dropping it without carrying
Nibbling: mandibulating the rim of the model
Intention-carrying: getting hold of the model with a stronger grip, and often dragging it a little way
Carrying: picking up the model, walking or flying away and dropping it at some distance from the nest
Poking: pecking into the hollow model, sometimes eating material left inside
Ignoring: making no response to the model, apart from looking at it

(For the statistical tests employed, which are mentioned separately below, see Siegel 1956.)

Experiment A

This was a pilot experiment in which no more than the two end-acts (carrying and rolling) were recorded; it was designed to see whether clear-cut results were at all possible with small numbers of birds. Empty eggs with holes of different sizes were used in this test. For reasons not to be discussed here, the holes were made at the sharp ends of the eggs (the hatching chick invariably cuts off a "lid" at the blunt end) and the edge of each hole was smooth, not serrated. We used eggs of approximately the same size; the size of each hole was expressed indirectly in the projected distance between its edge and the blunt pole of the egg.

The following models were used: "Small hole" (empty egg with edge of hole 51 mm. from end); "Medium hole" (similar but 45 mm.); "Large hole" (similar again but 36 mm.); and "Real shell" (egg-shell from which a chick had actually hatched the previous year). The models are all illustrated on plate 21 (b, c, d and h). The diameter of "Large hole" was approximately the same as that of the hole of a real shell. Each model was presented to twelve birds. Table 1 summarises the results.

TABLE 1—RESULTS OF EXPERIMENT A WITH BLACK-HEADED GULLS (*Larus ridibundus*), CUMBERLAND, 1961

This experiment was confined to recording the end acts of rolling and carrying (see above and plate 20). The total column gives the number of presentations of each model egg. The names of the model eggs and the small letters with them correspond to those on plate 21

	Rolling	Carrying	Neither	Total presentations
(b) Small hole	9	1	2	12
(c) Medium hole	9	1	2	12
(d) Large hole	4	6	2	12
(h) Real shell	0	9	3	12

For computing the significance of these results, the Fisher exact-probability test was used. The scores for "Small hole" and "Medium hole" are significantly different from those for "Large hole" ($p < .005$). Thus we reached three conclusions. First, a real shell is not rolled in (though in other tests it sometimes was, as can be seen from, for example, Table 2); when the bird responds to it at all, it removes it. Second, the hole must be fairly large to make the bird switch over to carrying in part of the tests. Third, a real shell elicits more carrying and less rolling than even "Large hole".

These results were, however, difficult to interpret. We did not know whether the birds reacted to the size of the hole, the hollowness, the extent of the rim, the surface area of khaki-colour or what; nor did we know whether the difference between "Real shell" and "Large hole" was due to the serrated edge or to the former's showing more white.

Experiment B

We next presented the following four models to new birds, and observed their responses in more detail: "Empty egg" (a blown-out egg, with hardly visible holes at both ends); "Filled shell" (a real egg-shell filled to the rim with plaster of Paris, so that it was not hollow and did not show a thin edge, but did have an interrupted and partly serrated contour); "Shell-with-lead" (a real egg-shell with, inside and at the obtuse end, a piece of white-painted lead equal in weight to a real egg); and "Real shell" (as in Experiment A). "Shell-with-lead" was heavier than "Filled shell". These models are also all illustrated on plate 21 (a, e, g and h). Table 2 summarises the results.

TABLE 2—RESULTS OF EXPERIMENT B WITH BLACK-HEADED GULLS (*Larus ridibundus*), CUMBERLAND, 1961

The responses of the birds presented with the model eggs were divided into the categories listed (pages 122-123). Several birds showed more than one response and so the sum of the individual columns exceeds the total number of presentations in each case. The names of the model eggs and the small letters with them correspond to those on plate 21

	Rolling*	Carrying	Lifting*	Billing	Nibbling	Poking	Ignoring	Total presentations
(a) Empty egg	24	0	0	10	0	0	0	26
(e) Filled shell	20	0	0	13	7	4†	3	27
(g) Shell with lead	4	5	7	1	21	12	1	25
(h) Real shell	5	13	2	4	16	3	3	27

*These categories include intention-rolling and intention-carrying respectively
†Doubtful responses

"Empty eggs" were always rolled in the same way as normal eggs. In Table 2 there is no significant difference in the treatment between "Empty egg" and "Filled shell", at least as far as the frequency of the responses is concerned. However, the latency of the response (i.e. the time between presentation and the start of the response) is significantly larger for "Filled shell" than for "Empty egg" ($p=.004$*).

For other conclusions we must bear in mind that some birds showed responses of both systems to one and the same model. As a basis of our statistical treatment, therefore, we took the numbers of birds which showed a certain response to some models but not to others, and compared these figures for each response with respect to different models.

The following conclusions can be drawn about rolling and intention-rolling. In all, 15 birds showed either rolling or intention-rolling to "Empty egg" but not to the other models, not a single bird did the opposite, and eight treated the models in roughly the same way. These figures are significant ($p<.001$).

Further, 13 birds showed rolling or intention-rolling to "Filled shell" but to neither "Shell-with-lead" nor "Real shell", one did the opposite, and twelve responded in one of these two ways to all three models. These figures are also significant ($p<.001$).

As soon as a model had a thin edge or was hollow, therefore, it was less likely to be rolled in: this was independent of its weight. The interrupted outline did not affect the scores, though, as we have seen, the latency of the response is larger for "Filled shell" than for "Empty egg".

Ten birds showed rolling or intention-rolling to both "Empty egg" and "Filled shell", but not to the two other models; no birds did the opposite; seven did not treat these two categories differently, and three behaved similarly to part of the two categories. These differences, too, are significant ($p=.001$).

Billing gave very similar results. Eleven birds billed "Empty egg" but not "Shell-with-lead" nor "Real shell", four did the opposite, and ten treated the models similarly ($p=.059$). The number of birds which showed billing to "Filled shell" but to neither "Shell-with-lead" nor "Real shell" was 13; four did the opposite, and eight did not show this difference ($p=.025$). Finally, the number of birds which showed billing to either "Filled shell" or "Empty egg" but to neither "Shell-with-lead" nor "Real shell" was 21; four did the opposite, and three did not distinguish clearly either way ($p<.001$).

Table 3 summarises further information that can be extracted about the difference between "Real shell" and "Shell-with-lead". The first

*All p values in the remainder of this paper were computed according to the sign test.

TABLE 3—COMPARISON OF RESPONSES OF BLACK-HEADED GULLS (*Larus ridibundus*) TO "REAL SHELL" AND "SHELL-WITH-LEAD", CUMBERLAND, 1961

This shows the numbers of birds which responded with each of the reactions listed in the first column to "Real shell" but not to "Shell-with-lead" (+), which did the opposite (—), or which did not differentiate (o) (p values based on sign test)

	+	—	o	Significance
Carrying	7	o	5	p= .008
Lifting*	o	5	2	p= .031
Rolling	2	o	3	not significant
Nibbling	1	15	4	p=< .001
Poking	o	10	2	p= .001

*This category includes intention-carrying

line allows us to say that "Real shell" elicited much more carrying, and the second shows that "Shell-with-lead" was more often merely lifted and then dropped. The fourth line shows that "Shell-with-lead" very often gave rise to mere nibbling, while the fifth says the same about poking.

These data demonstrate that neither model elicited rolling, but that both elicited some or all of the removal sequence. This obviously consists of two parts, nibbling and carrying, and it is also obvious that the "Shell-with-lead", while eliciting nibbling, stopped the real carrying which normally follows nibbling. In other words, the presence of the lead inhibited the action chain half-way. That this was due to the weight of the lead will become clear in the next experiment.

Experiment C

This experiment was designed to test four hypotheses which we had developed as the results of Experiment B took shape.

First, we had gained the impression that the "Real shell" elicited removal mainly through having a thin edge, rather than through being hollow. We therefore offered an empty egg with a flange of shell glued on it at right angles to the surface. The flange measured 2 cm. × 1.5 cm. and could be considered flat. This model, which we called "Flanged egg" (plate 21l), was presented with the flange turned up and the longitudinal axis pointing radially. It thus offered a thin edge, but no hollow.

Second, to see whether the fact of a shell's being hollow had some effect, and also to have a control model in connection with "Shell-with-lead", we filled a real shell with cottonwool so that it had very

much the same appearance as the plaster-filled egg or "Filled shell". However, whereas the plaster neatly fitted the edge, the cottonwool (though concealing the hollowness) allowed the bird to see the thin edge as separate from it. This model we named "Cottonwool shell" (plate 21f).

Third, to see whether a serrated edge was more stimulating than a smooth one, we introduced two model eggs with similar sized holes 40 mm. from the blunt end. One had a smooth edge and the other was artificially serrated. These we called "Smooth rim" (plate 21j) and "Notched rim" respectively (the latter is not illustrated here, but the notches were of the same size as the white patches on "Painted rim", plate 21k).

Fourth, we thought that a real egg-shell might owe part of its effectiveness to the amount of white it showed. A smooth-rim model (with a hole 40 mm. from the blunt end) was therefore given a series of white triangles along the outside of the rim, so as to fake a serrated edge to the khaki exterior. This was known as "Painted rim" (plate 21k).

With the "Real shell" as a control, there were thus six models in this experiment. Each of these was presented 18, 19 or 20 times, the slight difference being due, as in the previous tests, to some of the series being prematurely ended by nest-relief. The results are given in Table 4.

Although the scores for rolling and intention-rolling in Table 4 are higher for "Flanged egg" and "Cottonwool shell" than for "Real

TABLE 4—RESULTS OF EXPERIMENT C WITH BLACK-HEADED GULLS (*Larus ridibundus*), CUMBERLAND, 1961

This shows the numbers of birds which responded to the various model eggs with each of the reactions listed. The first two columns give the ultimate responses, irrespective of the incomplete movements which may have preceded them. The names of the model eggs and the small letters with them correspond to those on plate 21

		Rolling*	Carrying*	Billing	Nibbling	Poking	Ignoring	Total presentations
(l)	Flanged egg	6	12	4	12	0	1	19
(f)	Cottonwool shell	6	13	5	13	0	1	20
(h)	Real shell	1	14	6	11	5	2	20
(j)	Smooth rim	15	2	5	5	2	1	18
	Notched rim	9	9	7	6	1	0	19
(k)	Painted rim	12	8	12	4	5	0	21

*These categories include intention-rolling and intention-carrying respectively

shell", the differences are not significant. "Flanged egg" and "Cotton-wool shell" have not been compared in one series with "Empty egg" and "Filled shell" (Table 2), but neither of the latter models were carried even once; every single bird which responded to them did so by rolling. We must conclude, therefore, that "Empty egg" and "Filled shell" were treated like eggs (i.e. retrieved) and that "Flanged egg" and "Cottonwool shell" were treated like a real shell (i.e. removed), although we must leave open the question whether the birds distinguish to a slight extent between the different models within these groups. The main character to which the gulls respond by carrying must be one that is found in both "Flanged egg" and "Cottonwool shell" but absent from the other models. It follows that the thin rim is the important character and that neither hollowness nor broken outline, not their combination (as found in "Filled shell"), are sufficient to make the bird carry, although, as we have seen, "Filled shell" elicited rolling with a greater delay than an egg does.

The high carrying score for "Cottonwool shell" also shows that the low carrying response to "Shell-with-lead" (Table 2) was due to its weight and not to the sight of something inside the shell.

Turning now to the characteristics of the shell's rim (the figures in the three lower rows of Table 4), we find that these scores are not significant either. However, because the differences between these models are relatively simple and straightforward, it is worth extracting fuller information from our protocols and counting all responses shown in all tests instead of merely listing (as in Table 4) whether or not a response occurred in any one test. Many birds responded more than once in a test; moreover, many birds showed in one and the same test elements of both rolling and carrying. By counting all these responses in every case, we can determine for each test an index which gives the ratio between the number of egg-rolling movements and the number of carrying responses—a "retrieving-over-carrying index".

By comparing these indices for the various models, we find that in ten cases the index was higher for "Smooth rim" than for "Notched rim", in six the indices were equal for these two models, and one bird had a higher index for "Notched rim" than for "Smooth rim" ($p = .006$). Thus "Notched rim" elicited relatively more carrying than "Smooth rim", which in turn elicited relatively more rolling.

This same index was higher for "Smooth rim" than for "Painted rim" in eight cases, it was equal for both models in eight more, and one bird showed the reversed response. These differences are also significant ($p = .02$).

We can therefore conclude that both serrating the edge, as in "Notched rim", and adding the white pattern of "Painted shell" increased carrying and reduced retrieving.

SUMMARY AND CONCLUSIONS

Experiments were carried out at Ravenglass, Cumberland, in the summer of 1961, to determine how Black-headed Gulls (*Larus ridibundus*) distinguish between eggs and egg-shells. These elicit entirely different sets of responses: eggs are rolled into the nest and brooded, while shells are picked up in the bill and removed. The following paragraphs summarise the conclusions reached.

The egg-shell elicits removal because it differs from the intact egg in the following characteristics: it shows a thin edge; this edge is serrated; and it shows white. The "decision" to remove it is already taken before the bird can have checked its weight. Neither the interruption of its outline nor its hollowness could be shown to contribute to removal, though both seem to exert an inhibiting influence on rolling.

In addition, it was shown that egg-shell removal is a chain of acts: nibbling is elicited by visual stimuli; during nibbling the weight is checked and, if it does not grossly exceed that of a real shell, the object is carried; if it equals the weight of an egg or a chick, the chain is broken off. This prevents chicks from being carried away when they have hatched but not yet left the shell; whether other safeguards exist as well we cannot say.

Most of the population in which these responses were studied must have had previous breeding experience. Very little can be said, therefore, about the extent to which the responses are innate or could be the consequence of conditioning. Three one-year-old birds, which were tested with eggs and shells when they had not yet laid at all, rolled in an egg and removed a shell in a way indistinguishable from experienced birds (Tinbergen, Kruuk and Paillette 1962).

ACKNOWLEDGEMENTS

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Studies of less familiar birds

117. Scarlet Grosbeak

By Kenneth Williamson

Photographs by Eric Hosking

(Plate 22)

THE SCARLET GROSBEAK (*Carpodacus erythrinus*) is a primarily Asiatic bird whose range extends into eastern Europe. It is a rare visitor to Britain, apart from Shetland (notably Fair Isle) where it is of annual occurrence in the autumn. It is a species which is in the process of expanding quite vigorously north and west in Finland and, particularly if it should spread into Scandinavia, it may eventually be seen with greater regularity in Britain. Plate 22 and the notes which follow are intended to assist identification of what is a rather undistinguished bird when not in adult male plumage. The photographs were taken near Oulu, Finland, which is almost the present north-western limit of its breeding range.

The Handbook says "*Carmine head, breast and rump* of adult male, with browner wings and tail and *stout bill,* unmistakable"—and indeed, if all vagrant Scarlet Grosbeaks in this country lived up to their name, then identification would set no problem. Practically all, however, are either females or young of the year in a relatively nondescript plumage similar to the bird shown in the plate. I do not know of any way of distinguishing between the adult female and first-winter plumages except that birds with fresh-looking remiges and rectrices are probably adults which have recently completed the post-nuptial moult, since the young do not renew these flight-feathers in autumn. Even the first-summer males are exactly like the females and the pair at the nest in the photograph were almost identical.

Such birds might be overlooked as pale Corn Buntings (*Emberiza calandra*) or even hen House Sparrows (*Passer domesticus*), but there are a number of minor but quite distinctive points which will serve to identify them. The plumage of the upper-parts is a yellowish- or greenish-brown, sometimes a little brighter on the rump, often a little browner or greyer on the crown. The feathers are not so prominently dark-centred as in the other two species and, indeed, the mantle looks almost uniform at a short distance. The under-parts vary from greyish- to buffish-white with fine brown streaks which terminate abruptly on the lower breast in some birds, but in others extend on to the belly and flanks. There are prominent buffish-white wing-bars at the tips of the greater and median coverts, and the latter group of

feathers is often a darker brown than the rest of the wing. The tertials and inner secondaries also are tipped with whitish. (It should be noted that these wing-markings are greatly reduced in the much-abraded plumage of the breeding bird depicted in the plate.)

Besides the plumage differences, the Scarlet Grosbeak has quite a characteristic "jizz". Birds often adopt a dumpy stance, head retracted, as noted by L. S. V. Venables in *The Handbook*, and the sweet, tuneful call-note *twee-eek* is unmistakable. The beady black eye stands out prominently against the uniformly pale brown (sometimes inclining to rufous) cheeks, ear-coverts and lores; and the head itself always appears nicely rounded, a sparrow's being flatter by comparison. The heavy, conical bill, which continues the line of the forehead, is dark horn above and paler below, almost flesh-colour with a mauve or purplish tinge. The legs are dark flesh and the inside of the mouth is rose-red.

At Fair Isle, though sometimes alone, the birds are often in company with House Sparrows or Twites (*Carduelis flavirostris*), and frequent oat-stooks standing in the fields, or attack the seeding-heads of various weeds such as sowthistle (*Sonchus* sp.), ragwort (*Senecio aquaticus*) and autumnal hawkbit (*Leontodon autumnale*). The last week of August and first fortnight of September is their best period, but there have been occasional records into November, and George Stout recorded three associating with sparrows on 11th January 1930 (*Scot. Nat.*, 1930: 60). Though hardly an autumn passes without the occurrence of several birds, there is only one reliable spring record, for 2nd April 1926.

Notes

Peregrine incubating Kestrel's eggs.—On 13th May 1961, I was prospecting some crags in the Great Glen, Inverness-shire, in the hope of finding a pair of nesting Peregrines (*Falco peregrinus*). As I approached the most likely-looking face from below, a female Peregrine appeared in the air above and began to circle silently. She was still there half an hour later and her obvious reluctance to leave the place suggested an occupied nest, but her complete silence was abnormal for a bird with eggs or young. I worked my way to the crag top and, to my surprise, found a clutch of six Kestrel's (*F. tinnunculus*) eggs in the disused nest of a Raven (*Corvus corax*). I had not seen a Kestrel at all, although I had clapped repeatedly below. My surprise was all the greater because Kestrels very rarely nest close to Peregrines, at least on inland cliffs, and I was still expecting to find a Peregrine's eyrie there.

While I was making my way down a gully, the Peregrine suddenly stooped down and pitched on a shelf near the base of the crag. She sat there for a few minutes, then took wing, circled for a short while and finally swung into the now hidden upper part of the crag. The ledge where she had first alighted proved to be an empty eyrie; she had evidently been brooding there, for there were fresh flecks of down and traces of egg-shell which could have been recent. As the bird did not reappear, I returned to the top of the crag and, partly screened by vegetation, cautiously looked over at the Raven's nest. The Peregrine was incubating the Kestrel's eggs as though they were her own. I stayed there for several minutes only five yards from her, but she remained oblivious of my presence and was still sitting when I left.

Evidently the Peregrine had either lost her own eggs or been unable to lay, but still felt the urge to incubate. She had presumably dispossessed the Kestrels, which were nowhere to be seen, and adopted their eggs. I was not able to return later and so do not know how this peculiar situation ended, but the Peregrine was not behaving as a normal nesting bird and I thought it probable that she would eventually desert the eggs.

D. A. RATCLIFFE

Water Rail killing Wren.—At about midday on 2nd January 1962, Mr. R. Roe, who was building a sluice in the marsh on the R.S.P.B. Reserve at Minsmere, Suffolk, saw a Water Rail (*Rallus aquaticus*) run across a path, jab its bill into a Wren (*Troglodytes troglodytes*) and carry it off into the reeds. This incident, observed from four yards, occurred in a cold spell when most of the land was snow-covered, the ground frozen hard and the meres iced over. During this weather, Water Rails had become bold and two to four were frequently seen together on ground newly disturbed by machinery. The Wren had earlier been noticed in a wheel rut and, from the fact that it did not fly but moved only to one side when the workmen passed, was obviously weak. Mr. Roe, in answer to my questions about an hour after the incident, said that when the Water Rail jabbed its bill into the Wren, its mandibles were opened to about a quarter of an inch at the tips. The victim was carried off clear of the ground and was not held by a wing or a leg.

The Handbook has one record of a shrew (*Sorex* sp.) being taken by a Water Rail, but none of a bird. However, some comparable observations were published by Kenneth Williamson in 1949 (*Scot. Nat.*, 61: 31). He described the finding of a Water Rail and three Twites (*Carduelis flavirostris*) in the catching-box of a trap on Fair Isle on 2nd October 1948: one of the Twites had been partially eaten, another had recently been killed, "having a hole in the breast obviously made by a spear-thrust of the water-rail's bill", and the third was uninjured.

He also mentioned an experience of G. T. Kay, who introduced a Water Rail into a large outdoor aviary: this bird killed and ate a waxbill (Estrildidae), a Greenfinch (*Chloris chloris*) and a Chinese Quail (*Excalfactoria chinensis*). What was clearly the same incident was quoted by R. M. Lockley in *I Know an Island* (1938, p. 182), but he gave the birds concerned as a Quail (*Coturnix coturnix*), a Greenfinch and a Snow Bunting (*Plectrophenax nivalis*), the rail "picking out the meat and leaving the skins and bones clean in a remarkable manner . . ." The Minsmere record seems to differ from these others in that both the Water Rail and its victim were fully at large. H. E. AXELL

Woodcock alighting on bird-table.—I have two bird-tables in my garden at Scunthorpe, Lincolnshire. One of these is about two feet from a window and the other some five yards away. During the cold spell at the end of 1961 I kept both well supplied with "Swoop". At 1.30 p.m. on 28th December, I was astonished to see a Woodcock (*Scolopax rusticola*) on the nearer table. It was probing in the food and appeared to be eating. Unfortunately it soon saw me and flew off before I was able to make any detailed observations, but it seems quite remarkable that a wading species such as this should ever land on a bird-table at all, let alone try to feed there. The table is four feet high. The temperature at noon that day was 28°F and the ground was frozen hard. FRANK NORRIS

Distraction displays of Common Gulls.—I can add two comparable observations to the recent record of an apparent distraction display by a Common Gull (*Larus canus*) (*Brit. Birds*, 54: 429), but these are the only instances I have witnessed in many hours of study of this species at its breeding colonies in Ireland. On 14th June 1944, at Lough Corrib, Co. Galway, Common Gulls had young on a rocky islet from which I was just departing. The male left the islet in great agitation and flew low immediately in front of the boat. It half-settled on the water with wings beating violently, then rose, went a little further ahead and repeated the performance; this it did over and over again, giving the impression that it was trying to draw us away. Sometimes it was just above the surface with feet dabbling, at other times it actually sank on to the water. It kept turning its head round as if to watch us and it stayed extraordinarily close to the boat.

The other case was on Inishinny, near Bunbeg, Co. Donegal, on 13rd June 1948. A number of Common Gulls had nests and young in sandhills amid marram grass. Some of the adults were seen to fly low over a sandy slope, then run on tiptoe down it with half-spread wings. This was performed quite frequently and by several different birds. ROBERT F. RUTTLEDGE

Feeding behaviour of Kingfishers.—The note by N. L. Hodson (*Brit. Birds,* 54: 430) prompts me to record some observations that I made on Kingfishers (*Alcedo atthis*) between 3rd and 15th September 1961 at Estartit in Spain, by a small reed-fringed lagoon and at the mouth of a river. At the former locality, about a mile south of Estartit, one of these birds usually fed in the normal manner on small fish, but, in the absence of perches, used the sand-dunes as a vantage point. It also regularly hovered over the reed-beds, however, and on several occasions I watched it pick off one of the large numbers of dragonflies which were settled there. It would return to the sand-dunes to eat these, apparently devouring them whole.

At the mouth of the river, about two miles from the lagoon, what was presumably a second bird similarly made use of the sand-dunes as a vantage point, even in preference to the branches of trees overhanging the water. As well as fishing, however, this bird also quite frequently hovered over the dunes at a height of only a few inches, apparently following some moving object. It would then settle and catch and eat whatever it had been following. I was unable to see exactly what it was catching, but a search of the area showed that there were only occasional lizards and numbers of fairly large spiders. These latter frequently emerged from burrows in the sand and ran across the dunes. Had the Kingfisher been feeding on the lizards I should probably have been able to see them caught, and I decided that it was more likely that the spiders were its prey. In either case, I have been unable to trace any previous records of Kingfishers catching food on dry land in this manner.

The behaviour described above appeared to be anything but unusual with the birds concerned, both types of feeding being seen fairly regularly and on several dates. J. T. R. SHARROCK

House Martins building nest of cement.—During the dry weather in the early part of June 1961, at a site on the outskirts of Bishop's Stortford, Hertfordshire, a pair of House Martins (*Delichon urbica*) succeeded in constructing the greater part of their nest with wet cement in place of mud. The site itself is some forty feet above the ground on a private house. One or two pairs of House Martins have attempted to build there in several recent years, but the owner has invariably broken up the nests before the eggs have been laid. It was on 2nd June 1961 that I first noticed that material had been added to a crescent of mud left from the previous year and I was immediately interested in the peculiar tone of the fresh deposit, which appeared to be exceptionally yellow. About seventy yards away, the foundations of a new house and concrete drive were then being laid. It was the practice of the workmen to put down wet cement in the late afternoon,

and on 3rd and 4th June I was able to watch the birds gathering material. This they did in the evenings, after the workmen had gone and while the mixture was still wet. They appeared to take the cement only from the drive, where it contained a large proportion of sand, and to gather only the coarse, detached flakes between the worked surface and the wooden moulding along its edges. At no time did I observe any attempt to pick up material from the rammed, flattened face of the drive.

In most years, mud is abundant in the immediate vicinity of the site, where the soil consists of heavy clay and there are four small ponds, each with a marginal cattle-wade. At this particular period, however, several weeks without significant rainfall had dried these out completely. By 7th June, the lip of the nest-cup had made contact with the roof and the owner of the house prepared to destroy the structure. Hitherto, his custom had been to do so by hurling a tennis ball at the nest from the ground, but the cement had set so hard that this proved quite ineffectual; as a result, he was obliged to climb up by ladder and break the accumulated mass with a small hammer.

ARNOLD DARLINGTON

Unusual death of House Martin.—On 29th July 1961, at Hornsea, Yorkshire, I noticed an adult House Martin (*Delichon urbica*) suspended from its nest about sixty feet up under the eaves of a house. It was apparently dead, with its head held in a noose of grass or thread. Presumably it had become entangled in loose nesting material and, in struggling to get free, had eventually hanged itself. The other adult was busy feeding the young and continually brushed upwards past the corpse. The bird was still dangling there on 6th August, but had fallen down by the 13th. On this last date the remaining adult and four fully-fledged young were perched near-by. G. R. BENNETT

[There are many records of birds hanging themselves accidentally in loops of cotton or thread. Nestlings and juveniles are the most frequent victims, but experienced birds also occasionally come to grief this way. We have not previously heard of an instance involving an adult House Martin, however.—EDS.]

Hooded Crow asleep on the ground.—A recent note (*Brit. Birds*, 54: 405) described a Blue Tit (*Parus caeruleus*) and a Carrion Crow (*Corvus corone*) sleeping on the ground. On 20th July 1961, at about 5 p.m. and in bright sunshine, I noticed a Hooded Crow (*C. corone cornix*) standing quite still with its beak tucked under its scapulars—apparently asleep—some three feet from the edge of a thirty-foot cliff on the Isle of Canna, Inner Hebrides. I approached quietly to within

two feet of the bird, but hesitated momentarily before attempting to catch it. It suddenly woke up and jumped over the cliff, calling furiously. I was left with a tail feather in my hand! P. R. EVANS

Rook asleep on the ground.—On the afternoon of 10th July 1961, I came upon a Rook (*Corvus frugilegus*) apparently asleep on grassland near Lanchester, Co. Durham. Its head was tucked into its feathers and my first impression was that it must be sick. I approached to within a few feet of it before it awoke and flew off to join a party of about twelve other Rooks in an adjacent field. Its flight was perhaps a little erratic for the first yard or so, but thereafter appeared normal. Sleeping on the ground in this way certainly seems a highly dangerous thing for an arboreal bird to do, but I do not believe that this Rook was either injured or diseased. If it had been, I should have expected it to stand out from the other Rooks in the party which it joined, but neither on the ground nor in flight was it possible to distinguish it.
J. C. MANSON

Probable inheritance of crossed mandibles in Robins.—During the winter of 1960-61 our garden at Oxford was frequented by a cock Robin (*Erithacus rubecula*) with a completely crossed bill. This disability did not prevent his getting a good living, though he had a permanently tattered and bedraggled appearance, presumably through being unable to preen properly. He was very lively and aggressive and had found himself a mate by the end of February. Their first nest was not discovered, but the pair built again in June and five eggs were laid. All hatched and the young fledged safely, but one of the five had a crossed bill exactly like its father's. Unfortunately I was unable to keep track of this one after it left the nest. V. M. CAIRD

[The rather scanty evidence that is available on the inheritance of bill deformities was discussed by D. E. Pomeroy in his paper on "Birds with abnormal bills" which appeared in the February issue (see pages 60-61).—EDS.]

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PLATE 23A. River Warbler (*Locustella fluviatilis*), Fair Isle, September 1961. This shows the general shape, the blurred streaks on the under-parts, the stout bill and the indistinct supercilium (see opposite) (*photo: Angela Davis*)

PLATE 23B. Radde's Bush Warbler (*Phylloscopus schwarzi*), Norfolk, October 1961. Note the short and stout bill, the long and narrow, buffish-white supercilium, and the dark eye-stripe and crown (page 166) (*photo: P. R. Clarke*)

PLATE 23C. Blackbird (*Turdus merula*) with eye punctured, perhaps by the bird itself in trying to remove the large tick fixed behind it (page 166) (*photo: C. Stockton*)

British Birds

Vol. 55 No. 4
April 1962

River Warbler on Fair Isle: a bird new to Britain

By Peter Davis

(Plate 23a)

A first-winter River Warbler (*Locustella fluviatilis*) was trapped at Fair Isle on 24th September 1961, and seen again on the following day. This is the first record of this east European species in the British Isles, although it breeds as near to us as the Oder River in north-east Germany, and has occurred in southern Norway, Heligoland and Holland.

The bird was found shortly after noon on the 24th, in the incomparable "warbler-ditch" at Lower Leogh, by G. J. Barnes, R. M. Nedderman, P. J. Slater and the writer. It was skulking in tussocky grass in a shallow and open section of the drain; as we watched, it flew up to the lowest wire of the adjacent fence, and gave us a brief but unimpeded view from behind. It was obviously a *Locustella*, but one we had not previously seen; it was larger than a Grasshopper Warbler (*L. naevia*) and had dark olive-brown, unstreaked upper-parts. We were not able to see the underside, but noted an indistinct pale supercilium. Its fan-shaped tail appeared noticeably long and broad. Its legs and feet were seen to be pink, and seemed large and strong for its size.

A short single-panel mist-net was erected in the ditch, and within ten minutes of its discovery the bird was in the hand. It was taken to the laboratory, and was now seen by some fifteen other observers. The following description was made:

> Entire *upper-parts*, wings and tail dark olive-brown, with a rather rufous tinge, especially on the scapulars, wing-coverts and upper tail-coverts; feathers of crown and forehead indistinctly tipped darker brown, otherwise no streaking or barring above. Lores, cheeks and ear-coverts greyer brown; very indistinct

buffish supercilium. *Under-parts* whitish, washed yellowish-buff, with blurred and indistinct grey-brown streaking on chin, throat and upper breast; flanks and sides of breast washed grey-brown with yellowish overlay; centre of lower breast and belly whiter than rest of under-parts, unstreaked; under tail-coverts grey-brown with broad whitish tips; axillaries and under wing-coverts washed pale grey-brown, with pale yellow tinge on outermost coverts, near carpal joint. Outer web of 2nd primary dirty-white; shafts of tail feathers dark above, whitish below; flight-feathers in good condition, tail slightly chipped; twelve rectrices. *Soft parts:* upper mandible horn-coloured with slight flesh tinge, especially near cutting-edge, and lower mandible pale flesh tinged dark towards tip; gape pale yellow; legs and feet clear flesh-pink, paler behind and on the soles; eye dark grey-brown. *Measurements:* wing 73 mm., bill 16.5 mm., tarsus 23 mm., tail 52 mm.; weight 17.1 gm. at 1255 GMT. *Wing-formula:* 1st primary 5 mm. less than primary coverts; 2nd longest, 3rd −2.5 mm., 4th −5.5 mm., 5th −8 mm., 6th −11 mm., 7th −13 mm., 8th −16.5 mm.; no emargination; no notch on inner web of 2nd.

No method of ageing River Warblers is given in K. Williamson's *Identification for Ringers: 1* (1960), but according to H. E. Dresser's *A Manual of Palaearctic Birds* (1902), p. 136, "the young bird has the upper parts more rusty in tinge, the under parts tinged with ochreous, and the throat is also indistinctly striped". Our warbler showed these characters. In several other species of this genus the first-winter birds are said to be more rufous above, and in all they are more yellow below.

The warbler was photographed in colour by several of the visitors, and in black-and-white by my wife. The monochrome reproduction on plate 23a shows the general appearance, the blurred streaking of the under-parts, the stout bill and the indistinct supercilium. Towards the end of the photography it escaped from my hand and flew away; but about ten minutes later it entered one of the observatory buildings and was recaught. It was then transported to more congenial surroundings at the Gilsetter Marsh. Here we had excellent views as it crept among the sedges; the streaked breast seemed a good field-character on the occasions when a front or side view was possible.

None of the visitors nor I saw the River Warbler on the 25th, but it spent the day creeping about the stone dykes at Lower Stonybreck, and the occupants of that croft pointed it out to our cook, Pat Adams, during the afternoon. She watched it at close range through a window and saw that it was the ringed bird. It had disappeared by the following day.

We had to distinguish the Fair Isle bird from Gray's Grasshopper Warbler (*L. fasciolata*) and from Savi's Warbler (*L. luscinoides*), particularly the less rufous form *L. l. fusca*. Neither of these species has streaked under-parts, however, so that field-identification would probably have been possible even if we had been unable to catch it. The differences of size, wing-formula and coloration were readily available to us in Williamson's invaluable guide already mentioned.

Radar evidence on migratory orientation

By David Lack

Edward Grey Institute, Oxford

INTRODUCTION

LABORATORY EXPERIMENTS on orientation in animals are proceeding so rapidly that this may be a useful time at which to review evidence on the orientation of bird migrants over the sea provided by radar. This evidence requires local knowledge for its interpretation and, since even with local knowledge I have made mistakes in the past, I have restricted this paper to my own analysis of the data from East Anglia. These data came mainly from personal visits to a Norfolk radar station in March, April and September. In addition, I am extremely grateful to Dr. M. T. Myres, J. L. F. Parslow and J. Wilcock of the Edward Grey Institute for their observations in the same area in October and November; to the Department of Scientific and Industrial Research for substantial grants to finance their work; and to H.Q. R.A.F. Fighter Command and the personnel of the Norfolk radar station for providing us with every facility on our visits. I am also much indebted to the Research Laboratories of Marconi's Wireless Telegraphy Co., who kindly lent me for analysis their outstanding films of a radar display in this area taken at intervals throughout the year. Finally, Dr. J. F. Monk, R. E. Moreau, J. L. F. Parslow and Dr. A. C. Perdeck very kindly criticised the manuscript before publication, and Dr. Perdeck amplified the recent Dutch work on Chaffinch migration.

The radar observations from which the ensuing findings are drawn are described in a series of papers in *The Ibis* (by Lack 1960a, 1962 and in press, and for the Marconi films by Eastwood and Lack in press); if no further reference is given, the observation concerned is documented in one or other of these papers.

EXPERIMENTS ON ORIENTATION IN MIGRANTS

Nearly all the experiments on bird orientation have been carried out on non-migratory domestic pigeons (*Columba livia* var.), but there have been a few important exceptions. First, Rüppell (1944) caught many Hooded Crows (*Corvus corone cornix*) on passage through Rossitten in East Prussia and displaced them rather south of west to Flensburg in western Germany before release. The ringing recoveries of these birds showed that both their wintering area and especially their breeding area had been displaced to a corresponding extent to the west.

The same held for later displacements to the south-west in Germany. From this it was argued that Hooded Crows arrive in their winter quarters and return to their breeding grounds by travelling on a fixed bearing for a fixed distance; the factors determining this bearing and distance were unknown, but presumably had an innate basis. These results held for most adults as well as for the juveniles, but some individuals, mainly if not entirely adults, returned to their normal quarters.

Perdeck (1958) carried out similar experiments on the Starling (*Sturnus vulgaris*), another mainly diurnal migrant, which he caught in large numbers on passage in Holland, displacing them rather south of east before releasing them in Switzerland. He found that the displaced juvenile Starlings travelled in the same direction from their release-point as they would have taken from their place of capture to reach the normal wintering area in England; these birds returned to the same (displaced) wintering area in France in subsequent years, but the evidence was inconclusive as to whether or not there had been a corresponding shift in their northern breeding area. Displaced adults differed markedly from the juveniles in that they returned to their normal wintering area in England. Perdeck concluded that juvenile Starlings arrive in their winter quarters by travelling on a fixed bearing, whereas adults have true homing (or "goal") orientation, based on previous experience of the area concerned.

Kramer (1950, 1952) made the critical break-through in showing that a caged Starling in a state of migratory restlessness oriented itself by the sun. The fact that it did not head in the true migratory direction needs further study, but does not affect the conclusion that it used a "sun-compass". Shift of the apparent position of the sun by mirrors caused a corresponding shift in the orientation of the Starling. To use the sun to maintain a constant heading, it is necessary for the bird to allow for changes in the sun's apparent position with the time of day, and Kramer's pupil Hoffmann (1953, 1954, 1960) demonstrated experimentally that the Starling possesses the necessary "internal clock" (see also Schmidt-Koenig 1960). This suffices to explain how a juvenile bird can migrate on a fixed bearing by day. Later, Sauer (1955, 1957, 1958) showed similarly that juvenile warblers obtain their bearing at night from the stars; this he tested both under the natural sky and in a planetarium.

The other factor enabling a juvenile bird to reach the wintering area normal for the population to which it belongs is that causing it to cease migration after a while. Possibly the bird might react to the time for which it has flown, but whether in that case it makes any allowance for the wind is not known. Another possibility is that it might depend on an innate astronomical clue for its latitude. Sauer (1957)

claimed that a Lesser Whitethroat (*Sylvia curruca*) in a planetarium changed its orientation from SE to south when presented with the night-sky at the latitude of the Mediterranean, where it makes this change of heading in nature. He also had suggestive evidence that birds presented with the night-sky of their wintering area ceased their migratory restlessness. However, a Whitethroat (*S. communis*) taken thus to South-West Africa, at the extreme southern limit of the winter range of this species, continued to head southward, though three Garden Warblers (*S. borin*) were nearly inactive. Hence further observations on this matter are needed, especially in view of the criticisms of Sauer's work by Wallraff (1960).

One would also like to know why it is that, in autumn, caged migrants used for physiological experiments cease their migratory restlessness after a while; this might possibly be because they had been active for the time normally needed to reach their wintering area, but the situation is so unnatural that other explanations are possible. In spring, on the other hand, migratory restlessness is usually, though not always, maintained right through the summer until the moult (references in Lack 1960b). This might perhaps be because, in nature, migratory restlessness in spring is normally inhibited by breeding behaviour; alternatively it might be because the caged birds have had previous experience of their breeding area and are aware in some way that they have not reached it. Critical experiments are greatly needed.

The factors enabling an adult migrant to return to its home area after displacement on migration are also quite uncertain. This faculty is presumably the same as the "homing" of pigeons, and in this connection Kramer (1952, 1957, 1959, 1961) made the important distinction between the "compass-sense" (which for the homing pigeon, as for the juvenile migrant, is based on sun or stars) and the "map-sense", by which the bird is able, so to speak, to fix its position with respect to its goal so as to head in the correct direction after displacement. Matthews (1955) postulated that the sun provides not only the compass but also the sense of position, through variations in the sun-arc. Kramer (*loc. cit.*) and his school (Schmidt-Koenig 1960, Wallraff 1960) rejected this view on the grounds that the necessary discrimination of the sun-arc in the brief time available would make too great demands on a bird's visual acuity, time-sense, and capacity to compare with past experience. Matthews (1961) replied that more time might be available than previously supposed if the initial directions taken by homing pigeons on release were due to "nonsense-orientation" northward. Pennycuick (1961) produced a modified theory of sun-navigation, based on sun-altitude and its rate of change, but it is as yet untested and Schmidt-Koenig (1961) considered it to be contrary to some of the experimental evidence. While Kramer and his school concluded

that the sun is not concerned in the map-sense, they freely admitted their inability to suggest an alternative explanation.

In one of his planetarium experiments, Sauer (1957) shifted the night-sky to that appropriate, at the time in question, to an area far to the east, and reported that a juvenile Lesser Whitethroat then headed back west, instead of orienting to the south-east. This suggests that it obtained not merely its compass-direction but its map-position from the star-pattern. But the latter conclusion was challenged by Wallraff (1961). This was partly because of the diversity of Sauer's results. In addition, such a shift might be interpreted as a shift in time rather than space, since the star-pattern concerned would have reached the bird's home area some hours later; hence its internal clock might have been affected. Further a corresponding shift of the night-sky to the west produced no corresponding eastward heading by the bird. Sauer (1961) replied vigorously, but this point also should, I think, be regarded as unsettled. This is not, of course, to doubt Sauer's discovery that a night-migrant uses the stars for its compass-direction.

Finally, Merkel and Fromme (1958) and Fromme (1961) placed Robins (*Erithacus rubecula*), mainly juveniles, and a few Whitethroats, one of the species used by Sauer (1957), in circular cages out of all sight of sun or stars, and found that, when in a state of migratory restlessness, they oriented correctly south in autumn and north in spring. This orientation was lost, however, when the birds were placed in an enclosed steel chamber. It is desirable that this challenging result should be confirmed by other workers, since both Kramer and Sauer reported that their experimental birds failed to orient when sun or stars were obscured by cloud, or when a planetarium sky was diffusely illuminated with a weak light from the horizon without stars. Precht (1961), however, supported Merkel and Fromme because he found that Black-headed Gulls (*Larus ridibundus*) removed from their breeding colony and placed in a cage without sight of the sun tended to head in the direction of their colony (Precht *et al.* 1956). (Assuming that both Sauer and Fromme observed correctly, the contradiction might possibly be resolved by supposing that Sauer's birds had not really lost their map-sense, but that their migratory restlessness was inhibited because they could not use a "star-compass", whereas Fromme's birds for some reason retained their migratory restlessness, perhaps because they never saw the stars; but this is highly speculative.)

RADAR EVIDENCE ON TRACKS OVER THE SEA

The experimental evidence is highly conflicting, so let us now turn to the facts revealed by radar in eastern England. First, radar shows clearly that, both over the land and over the sea out of sight of land, migrants normally maintain approximately straight tracks. This

holds both in daylight and at night, and with a wind from any direction. If experiments had not already shown that migrants have a sense of direction independent of landmarks or of the wind, it would have been necessary to postulate one.

Secondly, the birds' tracks over the sea remain straight at the change from daylight to dark in the evening, as particularly observed in Lapwings (*Vanellus vanellus*) arriving from Holland, and at the change from dark to daylight at dawn, as particularly observed in small Passerines and waders arriving from Norway. Presumably at these times the migrants switch from a "sun-compass" to a "star-compass", or conversely. A change in the tracks was not, of course, to be expected, since waders regularly start on migration some two hours before sunset and continue during the night, so must have an adaptation to allow for this change. Similarly, night-migrants on a long sea-crossing must be able to fly on in daylight, and Saint Paul (1953) had earlier shown that at least some Passerine night-migrants can orient by the sun.

Thirdly, migrants flying sufficiently high over the sea to be detected by radar do not seem to allow for lateral displacement by a cross-wind ("drift" in the airman's sense), and drift is often as extensive over the land as over the sea. For instance, birds heading east from Norfolk in spring regularly proceed ENE or even NE with a southerly component in the wind, and ESE or even SE with a northerly component in the wind. Similarly the Passerine immigration heading SSW from Scandinavia in September, which reaches the sea off Norfolk in the early morning, there varies in direction between a little west of SW and a little east of south, according to the direction and strength of the local wind. (One qualification should, perhaps, be added. The radar display reveals migrating birds over an area of some 60 miles in radius, and within that area the direction of migration was normally constant, but this is based on a general impression of the radar echoes, not on individual echoes tracked for a long way. Hence the possibility that individual migrants might gradually change in direction over the sea to compensate for drift is not altogether excluded, but it is extremely unlikely and the change could, at most, be slight.) Since radar detects mainly the high-flying migrants, the findings do not exclude the possibility that migrants flying low by day might correct for drift by the use of landmarks or seamarks, and this has, in fact, been observed visually over the land and occasionally over the sea (Lack 1959c, pp. 390-391; 1960a, p. 54).

The normal absence of compensation for drift conforms with the view that, in migratory flight, birds travel on a direction fixed by their sun-compass or star-compass, in the same way that, with only a magnetic compass as guide, a man in an aircraft or a boat cannot allow

for drift by wind or current. This suggests that the migrant can fix its position by its "map-sense" only when it is settled, or at least that it finds it hard to do in flight and so does not normally attempt it.

Fourthly, there were a few occasions when migrants over the sea flew at random: the headings at any one moment were in every direction, and when individual echoes were tracked they showed marked and irregular changes in direction. On all such occasions, total cloud or rain was recorded at one or more of the coastal weather stations nearest to the area of sea concerned. Presumably, the migrants were disoriented because the sun or stars were obscured and they could not use their sun-compass or star-compass. It does not necessarily follow that their "map-sense" was also upset, if this is used only when the bird is settled. But it certainly follows that the non-visual sense claimed by Merkel, Fromme and Precht is inoperative in flight.

Disorientation on migration is rare. It was most easily detected on the speeded-up Marconi films, where it occurred on 8% of the mornings or evenings studied and for $3\frac{1}{2}$% of the total hours watched; the proportion of migrants disoriented was much lower than $3\frac{1}{2}$%, however, since usually only those in part of the area observed by radar were affected at any one time. Similarly, at the Norfolk radar station, disorientation was recorded over part of the sea on about $3\frac{1}{2}$% of the mornings or evenings watched in four successive Septembers and on about 11% of the mornings or evenings watched in four successive Octobers and Novembers, when full overcast is commoner. Over the sea, disorientation seemed about as frequent by day as by night, and it was also about as frequent over the land by night. But it was not normally recorded over the land by day, presumably because migrants do not start out in full overcast, while if they later meet it over the land by day, they either alight or fly too low to be detected by radar. Tinbergen (1956) showed that diurnal migrants can hold their direction more or less constant in full overcast when they fly low over the land by day, presumably with the help of landmarks, but that they become progressively less accurate with time unless they can glimpse the sun later.

CONDITIONS IN WHICH MIGRANTS SET OUT

Since radar for the first time provides an almost full record of migration in progress, it reveals the conditions in which migrants depart or are deterred from doing so. So far as orientation is concerned, two points are relevant. First, in both spring and autumn, by day and night, migration is much less in very cloudy weather. This is presumably because birds cannot use their sun-compass or star-compass in full overcast, and it is because they do not normally set out in full overcast (though they may fly into it later) that disorientation is, as noted above, so rare. Migration was not absent on by any means all the occasions

when the nearest weather station recorded full overcast, but this could well have been because the sky was partly clear, or clear for some of the time, in part of the area observed by radar.

Secondly, in autumn, by both day and night, migrants normally set out on migration only with a following wind within some 45 degrees of their heading, or when the wind is very light, and they usually start in settled weather. Since they avoid setting out with a strong cross-wind, drift is normally small in the area of departure, and, since they usually set out in settled weather, drift tends to be small later in their journey. On the other hand, in spring, by day and night, migrants often set out in a strong cross-wind and in fairly disturbed weather, so that drift is frequent and rather extensive. This difference is most readily explained on the supposition that juvenile birds, on their first migratory flight to winter quarters where they have never been, cannot compensate for drift, so that if they are drifted a long way they do not reach the area to which their population is adapted and may end in an area where they cannot survive. Juveniles probably comprise about half the birds migrating in autumn. In spring, on the other hand, all migrants are returning to an area where they have been before and so they can presumably compensate for drift. This interpretation fits with the displacement experiments on a variety of wild birds showing that they can home to their breeding area (summarised by Schüz 1952), and with Perdeck's (1958) finding that displaced juvenile Starlings do not reach their normal wintering area. It does not fit with part of Rüppell's (1944) results with Hooded Crows, which failed to reach their former breeding area after displacement, nor, for the opposite reason, with Sauer's (1957, 1960, 1961) claim that juvenile warblers can correct for longitudinal displacement by bico-ordinate navigation based on the stars on their first autumn flight. It should be added that there seems to be more urgency about the spring than the autumn migration, and this may be a further reason why birds sometimes set out in less good conditions in spring.

A further interesting point is that, while autumn migrants do not usually set out in strong opposed or cross winds, they migrate freely in strong following winds. This might possibly mean that a juvenile migrant does not depend on the time for which it has flown for its determination of where to end its migratory journey, since it will travel much faster with a strong following wind than with a weak following or weak opposed wind. This particular piece of evidence is, however, far from conclusive.

RESPONSES TO COAST

Radar shows that, at night, departing migrants coming to a coastline normally proceed straight over it and out to sea without deviation in

their tracks. Rarely, with an opposed wind and a nearly full moon, a little coasting was seen, but only when the coastline was close to their normal heading. The idea that night-migrants use "coastal guiding lines" (Williamson 1955, pp. 181, 183) can be ruled out.

In daylight, also, most migrants proceed straight over a coastline and out to sea without deviation, but with opposed winds or in disturbed weather a proportion of them not infrequently follow a coastline close to their heading, and the coasting birds may later leave in a concentrated stream from a projecting headland or sharp turn in the coast. A visual observer on the coast may see a misleadingly high proportion of migrants coasting, not merely because the coasting birds fly past him instead of across (Van Dobben 1953, p. 216), but also because many of those crossing the coast may be altogether above visual range. The idea that day-migrants are effectively "guided" by coastlines to their winter quarters can also, I think, be excluded—except perhaps in the case of the Chaffinch (*Fringilla coelebs*), discussed later. (It may be noted in passing that the term "guiding-line" was not originally used in this definitive sense, *cf.* Van Dobben 1953, Lack 1959c, p. 386).

Radar shows that immigrant birds over the sea by day often alter course towards the coast when within some ten miles of it, presumably because they have seen it, and this sometimes involves a temporary change in their direction of up to 45 degrees. It also means that a visual observer on the coast may obtain a misleading idea of the direction of the main passage over the sea, as I earlier inferred from visual observations on arriving Starlings (Lack 1954, p. 3).

After crossing the North Sea westward from Holland in autumn, diurnal migrants sometimes (but not by any means always) turn upwind along the Norfolk coast. With a northerly wind, the coasting stream in east Norfolk moves north, in north-east Norfolk NW, in north Norfolk west, and on the east side of the Wash south, so that, if an individual continues along the coast for the whole distance, it eventually turns through 180 degrees. I have discussed elsewhere (Lack 1959c, p. 386) why migrants might continue coasting beyond a marked turn in the coast. The initial tendency to coast upwind after a sea-crossing needs further study.

More complex changes in direction were sometimes detected by radar when migrants were within sight of land by day, such changes being particularly marked on Marconi films covering the Straits of Dover. Birds departing from Cap Gris Nez WSW often turned west in the Straits or the English Channel and eventually WNW. This was not a simple response to the sight of the Kent coast, because the place where, on average, the birds changed direction differed rather markedly on different days and also at different times on the same day,

while different individuals sometimes differed at the same time. Sometimes, moreover, the birds continued changing towards NW when already well over Kent. Similar changes were occasionally observed near North Foreland, in diurnal migrants that had come NNE through the Straits of Dover and later changed to NNW; and here also, the birds by no means always turned so as to reach land as quickly as possible. This suggests that a gradual shift in the standard direction of the migrants was involved; changes of this type with time of day have been demonstrated for the Chaffinch in Holland in autumn (Van Dobben 1953, A. C. Perdeck in discussion).

The most elaborate changes in direction correlated with a coastline are those of the Norwegian Chaffinches, just mentioned, which pass through Holland in autumn. These birds leave southern Norway probably rather east of south, change to SSW in Denmark and eventually to WSW as they move south down the east side of the North Sea. After they reach northern Holland, some take off WSW for eastern England, but others continue along the coast to Cap Gris Nez, from which many leave WNW (Van Dobben 1953, Perdeck 1961 and *in litt.*). Others follow the coast south and west beyond Cap Gris Nez and presumably later turn north to reach England, as has been shown for the Starling (Klomp and Perdeck 1959). This movement brings the Norwegian Chaffinches to England by a short crossing of the North Sea. But the birds actually follow the coastline chiefly in adverse weather, particularly with a strong head-wind, and also in the latter part of the morning when the migratory urge is presumed to be waning, while adult males do so to a greater extent than females or juveniles (Van Dobben 1953, Perdeck 1961). In the early mornings in good weather, the birds fly high and are not directly influenced by the coastline, but their direction of flight still varies progressively round the North Sea in the way described. This suggests that, though their direction can be modified by sight of the coast, they are not directly "guided" by it, and that the primary factor involved is a progressive change in the standard direction or innate heading. In this connection a Marconi radar film showed that, on a large westward arrival, presumably of Chaffinches, in early October, some of the birds far out in the southern North Sea off Suffolk had already turned NW, whereas others flew west or WSW here and changed to NW only after crossing the English coast. If the successive changes in direction have an innate basis, they presumably depend in some way on distance flown, but, once again, it is not known how the birds estimate this.

LONG-DISTANCE CHANGES IN DIRECTION

The Norwegian Chaffinches just discussed seem exceptional in the

extent to which they change their heading in the course of their migratory journey, some of them eventually through 180 degrees, from SE to NW. Smaller changes in heading occur in two groups of European Passerine night-migrants that winter in tropical Africa. First, the Lesser Whitethroat, Red-backed Shrike (*Lanius cristatus collurio*) and Lesser Grey Shrike (*L. minor*) leave western Europe about SE and change to south somewhere around the eastern Mediterranean; secondly, the great stream of warblers and flycatchers migrating SW and SSW in autumn through western Europe to Iberia must there change to east of south in order to reach any point in tropical Africa, where they winter (Moreau 1961). These changes presumably have an innate basis, and they are presumably made either after the migrants have flown for a given time or distance, or when they have reached a given latitude, as discussed earlier.

Radar has revealed two further "dog-legged" migrations. First, the vast majority of Passerine night-migrants that breed in Britain leave in late August and September just east of south, not SSW; but, since ringing recoveries show that they later reach western Iberia with the main European stream, they evidently change their heading from a little east of south to well west of south somewhere near the southern border of France. The same birds must change again to east of south in order to reach their tropical wintering areas, as already mentioned. Hence they make two changes in heading in the course of their journey, and both presumably have an innate basis.

Secondly, many Knot (*Calidris canutus*) reach Norfolk in August and early September on days when the wader migration tracked by radar comes SSW. As Knot do not breed in appreciable numbers west of the Taimyr peninsula, they presumably change from nearly due west to SSW before leaving Scandinavia. Similar considerations apply to a smaller extent to various other arctic waders.

REVERSED MIGRATION

The two main migratory movements over East Anglia in spring are of winter residents departing eastward and of summer residents arriving from the south and heading NNW. But not infrequently with a cold easterly wind there is a westward arrival from the east, and occasionally with a cold northerly wind there is a southerly departure. Such "reversed migrations" occur by both day and night and, though their existence was known earlier, they have proved to be much commoner in East Anglia than was formerly supposed. Their survival value is obvious. But their occurrence presents a complex problem in orientation, as pointed out by Sauer (1961, p. 234), since night-migrants in spring respond to the spring star-pattern by travelling in the direction appropriate to the autumn. This phenomenon presents no

particular difficulty, however, if the birds use the stars or sun purely as a compass.

Similarly, small movements of Passerines occur eastward from East Anglia with westerly winds at intervals throughout the autumn and, at least in October, these probably include reversed migrations, as the echoes resemble those from thrushes. Three ringing recoveries also demonstrate such reversed movements in this group. A Blackbird (*Turdus merula*) ringed at Spurn Point, Yorkshire, on 6th November 1954 was recovered four days later in Germany (*Brit. Birds,* 48: 492); another ringed on Fair Isle on 21st November 1958 was recovered in Norway ten days later (*Brit. Birds,* 52: 474); and a third ringed on Fair Isle on 14th October 1959 was recovered in Norway two days later (*Brit. Birds,* 53: 492). Also, a Redwing (*Turdus musicus*) ringed on Bardsey, Caernarvonshire, on 11th October 1959 was recovered in Belgium a month later (*Brit. Birds,* 53: 491), again an eastern movement, but not a reversed migration for this species. Another curious autumn movement, a small one restricted to nights in late August and September with a wind between NE and SE, is that of small Passerine night-migrants heading west from Holland to East Anglia. Accompanying "falls" at the east coast observatories indicate that typical Continental night-migrants, notably Redstarts (*Phoenicurus phoenicurus*) and Pied Flycatchers (*Muscicapa hypoleuca*), participate. As these species normally migrate SSW towards Iberia, this is not a true reversed movement, nor is it directly down-wind, and its significance is quite obscure. More typical reversed movements occur northward in autumn with southerly winds, but they are extremely sparse and rare in East Anglia. They are commoner elsewhere in England (J. L. F. Parslow in press), while much bigger northward movements with southerly winds in autumn have been demonstrated by radar in eastern U.S.A. (Drury, Nisbet and Richardson 1961).

REDETERMINED MOVEMENTS—EVIDENCE FROM RINGING

Radar has provided no evidence for the existence of "down-wind directed drift", by which Williamson (1952, 1955, 1959) supposed that migrants disoriented over the sea in full overcast descend low, reorient by the waves, and fly down-wind; but the negative is not conclusive, since if such flights occur they would probably be below radar range. Williamson considered this type of "drift" a valuable adaptation enabling the birds to escape from full overcast, and it is an essential part of this theory that the drifted birds (many of which would be juveniles) should afterwards be able to correct for their displacement by a "redetermined" movement. In this connection, Williamson (1955) stated: "it is already clear from a preliminary examination of a number of bird observatory records that drifted birds quite

obviously have a faculty for accurate re-orientation, and are not 'disoriented waifs', as some students of migration have claimed". This view accords with Sauer's (1957, 1961) claim that juvenile warblers can correct for displacement by bico-ordinate navigation based on the stars, but not with Perdeck's (1958) finding that juvenile Starlings do not correct for displacement; however, the Starling usually migrates by day.

The point is so important that I decided to examine the records, published annually in the "Reports on bird-ringing" in *British Birds,* of probable Scandinavian night-migrants ringed at the British east coast observatories in autumn and later recovered outside Britain. The most spectacular was a juvenile Red-backed Shrike ringed in Northumberland in late August and recovered in Sicily a month later (*Brit. Birds,* 48: 496). This species normally migrates SE, however, and there is no evidence that the bearing of Sicily from Northumberland differs from the normal heading in autumn of the population to which this bird belonged. On present evidence, therefore, this bird might well have headed in the same direction as before it drifted to England, without any correction for displacement.

Better evidence comes from the many Robins ringed after the great "fall" on the English east coast in early October 1951. Of six then ringed at Spurn Point in Yorkshire or Cley in Norfolk and later recovered abroad, one in the Gironde and two in Charente Maritime, France, were nearly due south of where ringed, but two in Minorca were SSE and one in Italy was SE; another ringed on the Isle of May, Fife, was recovered SSW in Portugal. One might perhaps conclude from this that the first three and the last were juveniles, and the others adults, and that the three adults corrected for displacement by heading south-eastward to their normal wintering grounds, while the four juveniles failed to correct and continued on their normal south or SSW heading, thus reaching a different wintering area. But other explanations are possible, for instance that two different Robin populations with different wintering areas were involved in the "fall", so the evidence is quite inconclusive.

After another Robin arrival in early October 1959, chiefly in south-eastern England, six recoveries were SSW of where ringed, in Iberia (Williamson and Spencer 1960). This might suggest that no change in heading occurred, but these birds may not have been drifted appreciably off-course to the west in the first place. A seventh Robin ringed on Fair Isle in the same period must have been drifted west, but, as it was later recovered SSW in Portugal, it may not have changed its heading on leaving Fair Isle.

The other Scandinavian chats, warblers and flycatchers, which between them comprise the bulk of the September "falls" at the east

coast observatories, have provided very few ringing recoveries abroad. Of the species which normally migrate south-westward (i.e. omitting the Lesser Whitethroat), none of those ringed on the British east coast in autumn have been recovered in the same autumn appreciably east of where ringed. The most typical Scandinavian migrant is the Pied Flycatcher and, of the seven recoveries abroad in the same autumn, six were SSW of where ringed, five in Portugal and one at Cadiz, while one was south of where ringed, in Charente Maritime, France. Hence all seven were in areas regularly frequented by Scandinavian migrants on passage. But it is not know whether these ringed individuals were adults or juveniles. Nor is it clear whether they appreciably changed their heading after leaving England or whether they continued on the same SSW heading as before, while the one individual recovered south of where ringed might, presumably, have been drifted eastward in the Bay of Biscay by the prevailing westerly winds. Similar doubts attend the few recoveries of other drifted species.

Clearer evidence for redetermined movements is provided by the Continental Redwings (*T. m. musicus*) ringed in autumn on Fair Isle. These birds normally head south-westward, so they were evidently drifted off-course to Fair Isle and several have later been recovered in Continental Europe between south and SSE of where ringed (Goodacre 1960), presumably having corrected for this displacement. Similarly, Continental Song Thrushes (*T. p. philomelos*) ringed at British east coast observatories after presumed westward drift on autumn passage have been recovered on the Continent between south and SSW of where ringed (Goodacre 1960), though the changes in direction have been less marked than in the Redwings. In both species, however, the proportion of recoveries is so small that all may have been either adults returning to wintering grounds known from a previous year, or juveniles accidentally drifted back east by the prevailing westerly winds later in their journey. Hence the possibility remains open that the bulk of the juveniles did not correct for drift, but continued south-westward into the Atlantic and so did not provide any ringing recoveries.

There is, therefore, no convincing, or even suggestive, evidence from the ringing recoveries that drifted juvenile migrants in their first autumn can redetermine their direction towards the normal wintering area for their population. This is, of course, a negative statement, and the possibility that juvenile migrants have this capacity is not excluded. If they have it, however, it would seem to require an extremely complex behavioural mechanism. The juvenile migrant must be able not merely to respond to a succession of star patterns, but by their means to compensate for lateral displacement away from an area of which it has no prior experience, all on an innate basis. One

must beware of rejecting a hypothesis because it seems to ask too much of a biological mechanism, but it is legitimate in cases of this sort to ask that the evidence in favour of the hypothesis be strong, and as yet it is weak or non-existent.

It may be added that if juvenile birds in their first autumn do not have the capacity to correct for drift, this might help to explain why nearly all "rarities" (i.e. birds far beyond their normal range) are juveniles in their first autumn. Failure to correct for drift could not, however, provide the whole explanation of this phenomenon, as some of the rarities have come such immense distances that one must suppose that either their innate headings or their star-compasses were astray.

REDETERMINED MOVEMENTS—EVIDENCE FROM RADAR

I earlier claimed (Lack 1959c, p. 394) that radar evidence supported the idea that drifted migrants later redetermine their course. This was particularly because, after big "falls" of Scandinavian night-migrants in Norfolk with SE winds from 2nd to 4th September 1958, I detected by radar, on subsequent nights with westerly winds, eastward departures of small (Passerine-type) echoes, which I postulated were the drifted birds returning to the Continent. Later experience has shown, however, that such eastward departures occur regularly from Norfolk in autumn with westerly winds and are unrelated to previous "falls", so they are not, or at least are not mainly, redetermined movements. Unfortunately radar has not revealed the direction later adopted by the Scandinavian chats, warblers and flycatchers after autumn "falls" in Norfolk, probably because they comprise so small a fraction of the migrants on any one September evening that their echoes are swamped by those from departing summer residents.

I also (Lack 1959a, b, c) thought that I detected redetermined movements heading SSE in early April 1958, after big "falls" of Continental migrants on the British east coast with SE winds in late March. Moreover, the echoes heading SSE stopped at the Norfolk coast, where typical Continental species or subspecies were seen. I think there is no doubt, in this case, that the movements heading SSE were indeed of returning Continental birds. It was later suggested to me that it might be more correct to interpret them as reversed, rather than redetermined, movements, since the birds' heading was nearly due south. However, the main direction of Continental night-migrants in spring is probably NNE, and so, if this held for the migrants in question, a movement SSE was not directly in reverse. I therefore think that these were true redetermined movements. As such, they present no particular theoretical difficulty in spring, as the birds are returning to a known goal.

A more curious movement was often seen over the North Sea north

PLATE 24. Rock Bunting (*Emberiza cia*) at nest, Spain, May 1961. The breast nd head are grey with black bands over, through and below the eye; the under-parts re buffish-orange, and the back is chestnut streaked with black. The females are nly slightly less well marked than the males (pages 158-162 *photo. Arthur Gilpin*)

PLATES 25 and 26. Habitat and nest of Rock Bunting [illegible] Spain, May-June 1961. Habitats vary from steep rocky ground in mountains to more gentle slopes with scattered bushes, and from several thousand feet down almost to sea-level in some places (page 150) *photos: H. R. Lewis, Jr. and Inez or Guido*

PLATES 27 and 28. Rock Buntings (*Emberiza cia*) at another nest, Spain, June 1961. Note the unstreaked chestnut rump. This nest was at a height of three or four feet, but many are among stones on the ground (page 160). Only the female incubates, but both feed the young (*photos: K. J. Carlson, below, and R. G. Carlson*)

PLATE 29. Rock Sparrow (*Petronia petronia*), Spain, May 1961. It resembles a female House Sparrow, but note the whitish spots at the end of the tail and the striped head pattern; the broad pale superciliary is set off by the dark side to the crown and the dark patch behind the eye (pages 162-163) (photo: *Arthur Gilpin*)

130. Rock Sparrow (*Petronia petronia*), Spain, May 1961. This head-on shows the streaked under-parts and the boldly barred under tail-coverts. The pattern is completed by an equally distinctive pale stripe running the length crown from forehead to nape. The sexes are identical (photo: H. R. Lowe)

PLATE 31. Nest-site of Rock Sparrow (*Petronia petronia*), Spain, May 1961. This colonial species usually breeds in holes in broken rocky country or deserted buildings, but some nest in hollow trees and here the birds were sharing a river bank with Bee-eaters in pleasant fertile country (page 162). (*photo: Arthur Gilpin*)

of Norfolk on October mornings, by Myres in 1959 and by Parslow in 1960, though we did not appreciate its significance until Bourne and Myres (in prep.) saw similar movements off northern Scotland. With SE winds over the North Sea during the night and morning, the radar display often showed around sunrise a moderate or large immigration heading SSW towards Norfolk, the echoes being typical in size and speed of those from thrushes. These echoes later decreased in density, while others became common which were of similar size and moved at similar speed, but which headed about SSE, and these usually reached their highest density around 10 a.m. A similar phenomenon was also seen with NE winds over the North Sea, except that on two such occasions there was already a large immigration heading SSE at sunrise. On one of these last occasions, and on several mornings with a SE wind when both SSW and SSE movements were detected, there was an arrival of Continental Redwings, Fieldfares (*Turdus pilaris*) and Continental Robins (*E. r. rubecula*) at the English east coast observatories. These were presumably the species detected by radar and, to judge from the size and speed of the echoes, thrushes greatly predominated. On none of these occasions were any echoes detected moving SSE over the land, but on quite a number of them, including those when the whole movement over the sea was SSE, similar echoes moved SSW over the land.

These observations indicate that, with easterly winds in October, Scandinavian thrushes heading SSW during the night change their heading to SSE in the first part of the morning while in flight over the North Sea. The direction of the change, through about 45 degrees towards the east, suggests compensation for drift by easterly winds. As such, however, it was not entirely effective, since with a fairly strong easterly wind, the resultant tracks were on some occasions due south and rarely west of south. Usually, all migrants travelling over the sea eventually changed to a SSE heading, and since it seems unlikely that all the birds on all these movements were adults, the behaviour in question presumably occurs both in adults and in juveniles migrating for the first time. Similar behaviour was not recorded during the frequent SSW immigrations towards Norfolk of Scandinavian chats, warblers and flycatchers with easterly winds in late August and September.

This thrush behaviour might be explained in one of several ways. The possibility that the birds are compensating for westward drift by ico-ordinate navigation after sunrise, though not excluded, seems nlikely. Pointing against it, the change always seemed to be from a eading of SSW to about SSE, irrespective of the strength of the wind nd hence of the amount of drift, while over the land the birds changed ack to a heading of SSW. As a second possibility, Tinbergen (1956)

showed that Chaffinches migrating through Holland gradually alter their heading during the course of the morning from WSW to SSW and eventually SE; this behaviour is restricted to days with easterly winds (A. C. Perdeck in discussion). In contrast, however, the alteration in direction of the Scandinavian thrushes over the North Sea did not appear to be gradual, since, during the period of change on the mornings concerned, the birds headed either SSW or SSE, and not south; hence each individual presumably changed sharply. A third possibility, the simplest on the available evidence, is that the Scandinavian thrushes have a response while on migration such that, if they find themselves over the sea at dawn, they change their heading from SSW to SSE. But as such a change was not observed on the SSW arrivals with a westerly wind in the North Sea, this response is evidently evoked only if the birds are aware, in addition, that they have been drifted west.

They might recognise westward drift either by reference to objects on the sea or by the later rising of the sun. On one occasion when there were SE winds throughout the North Sea during the night, resulting in extensive westward drift, the wind was light SW off Norfolk next morning; yet the birds evidently changed direction to SSE, though reference to the surface of the sea at dawn would have indicated eastward, not westward, drift. Conversely, on two occasions with westerly winds during the night in the northern North Sea, so that there was no westward drift, there was a light easterly wind off Norfolk next morning; yet the birds did not change direction. Perhaps, therefore, they react to the later rising of the sun, but the relationship is not quantitative, i.e. they do not vary their heading in relation to the extent of their drift. Clearly, further study of this remarkable behaviour is greatly needed, and all the conclusions in this section are highly tentative.

The relatively simple behaviour here postulated, namely a fixed change in compass heading in response to sight of the sea at dawn, together with awareness of westward drift, might well be a valuable and effective adaptation for birds liable to drift seaward into the Atlantic, or to overshoot their wintering grounds in Ireland. It is curious, however, that the Scandinavian chats, warblers and flycatchers in September do not show similar behaviour off Norfolk. But they have much further to travel, for whereas many of the Scandinavian thrushes spend the winter in Britain, the chats, warblers and flycatchers are on their way to tropical Africa. Possibly, therefore, these smaller species show a similar response further south in their journey, e.g. off Iberia.

With easterly winds off northern Scotland in October, Bourne and Myres (in prep.) found, similarly, that Scandinavian thrushes often

came in south-westward during the night, flew low over the sea after midnight, rose high at dawn, and then flew either SSW or south-eastward, and sometimes eastward or north-eastward. Evidently a similar phenomenon occurs here—indeed, this was where it was first recognised—and it appears to be more complex than off Norfolk, but the details have not yet been worked out.

There are also corresponding movements in autumn off eastern USA, where night-migrants may be drifted eastward into the Atlantic by north-westerly winds. Visual observations on the mornings after such movements show that many birds return westward to land (Baird and Nisbet 1960), but, since British migrants in sight of the coast head directly towards it, visual observations may not show the true change in direction over the sea out of sight of land. The return movement has now been confirmed by radar (Drury, Nisbet and Richardson 1961), but such details as the precise westward headings of the birds over the sea, and whether any of them continue south-eastward by day, have not yet been published.

CONCLUSION

The radar observations reviewed here provide no decisive answers to the questions raised by the conflicting experiments discussed at the start of this paper. Ultimately, the answers must come from critical experiments, but meanwhile the tentative conclusions suggested by radar may be summarised. In general, the radar observations fit best with the view that migrants in flight orient solely by a sun-compass or star-compass, since they do not, so far as can be determined, allow for lateral displacement by the wind (unless flying very low). On this view, a drifted adult migrant re-orients by its postulated map-sense only after it has alighted. Hence the occurrence of disorientation in full overcast might mean merely that the compass-sense is then inoperative, and it does not necessarily follow that the map-sense depends on sun or stars; it does follow, however, if the map-sense depends on non-visual means, that this is not used, and presumably cannot be used, in flight. The existence of reversed movements in spring and autumn may also be held to favour the view that the birds use sun or stars primarily as a directional compass, since otherwise they must sometimes use the star-pattern appropriate to one season of the year to navigate in the direction appropriate to the opposite season.

Radar observations also fit best with the view that juveniles in their first autumn do not use bico-ordinate navigation, since it is otherwise hard to see why the wind conditions in which migrants set out are such as to minimise drift in autumn (when many juveniles are travelling), but not in spring (when all are returning to an area where they have been before). If, however, the juveniles travel on an innate

heading, some other (innately based) factor is needed to determine when they stop, and, since they set out freely with strong or light following winds, or with light opposed winds, this factor is not, perhaps, dependent on the time and distance for which they have flown through the air. It is also necessary to postulate for various species that the innate heading is changed during the course of migration. Indeed, various British night-migrants evidently change their heading twice on their way to Africa, while Scandinavian Chaffinches have a progressive change in heading through perhaps 180 degrees between Norway and southern England or Ireland. Finally, Scandinavian thrushes drifted westward by easterly winds in autumn change their heading from SSW to about SSE when in flight over the North Sea by day, but apparently return to a SSW heading after making the land. On present evidence this can be explained as a relatively simple response to the sight of the sea, and bico-ordinate navigation need not be invoked.

Finally, I would stress again that the above conclusions are highly tentative and that the problems raised can be solved only by experiment.

SUMMARY

(1) In daylight and at night, migrants over the sea normally travel on straight tracks, with no alteration in direction at the change from daylight (sun-compass) to dark (star-compass), or the converse.

(2) Migrants do not normally allow for lateral drift, suggesting that in flight they use only their compass-sense and not their map-sense.

(3) Migrants are disoriented when sun or stars are obscured, but this might be merely because their compass-sense cannot be used.

(4) Migrants do not set out when it is very cloudy. In autumn they normally set out with a following or light wind, thus minimising drift for the juveniles migrating to an unknown area. In spring they often set out in a strong cross-wind, so that drift may be extensive, but the birds are returning to a known area.

(5) Night-migrants do not normally follow the coast. Various reactions of diurnal migrants to the coast are discussed.

(6) Several types of long-distance migrants change their heading during their journey, some of them twice, and Chaffinches (*Fringilla coelebs*) in a complex way.

(7) Reversed migrations occur in both spring and autumn, initiated over the land with winds opposed to the normal direction of migration for the season concerned.

(8) Ringing recoveries as yet provide no evidence that juvenile migrants in their first autumn can correct for drift by a redetermined movement.

(9) Norwegian thrushes (*Turdus* spp.) drifted westward over the sea by easterly winds in autumn change direction in daylight from SSW to SSE, probably as a response to sight of the sea combined with awareness of westward drift.

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Studies of less familiar birds

118. Rock Bunting and Rock Sparrow

By P. A. D. Hollom

Photographs by K. J. Carlson, R. G. Carlson, Arthur Gilpin and H. R. Lowes

(Plates 24-31)

THE ROCK BUNTING (*Emberiza cia*) is an extreme rarity in this country. The earliest record is of two netted by bird-catchers in late October 1902 near Shoreham, Sussex, and these were followed by one seen at Faversham, Kent, in mid-February 1905; then, after an

interval of over fifty years without any report which can now be considered acceptable, one was recorded at Dale Fort, Pembrokeshire, on 15th August 1958.

The species has also occurred as a vagrant in north France, Belgium, Holland and Heligoland, but the nearest breeding places are south and east France, Switzerland and south and west Germany. In the last country its range extends north down the Rhine valley to the neighbourhood of Bonn, as well as in a few tributary valleys, especially that of the Moselle. It is also found throughout the Iberian peninsula, most of Italy, Greece, the Balkans and in the Carpathian mountains where it extends west into Czechoslovakia and north Hungary; in north Africa from Morocco to Tunisia; and across Asia from Turkey through the Himalayas to eastern China and Mongolia.

Vaurie (1959) lists ten races, and describes the bird as not migratory but to some extent a wanderer. In Germany, however, it is regarded by Niethammer (1937) as both a resident and a migrant with winter-quarters in north Africa; most of the German breeding birds leave in October or November and return in March or April. Similarly, in the Geneva area Géroudet (1954) finds that most are migratory, arriving in early or mid-March and probably continuing to do so into April; in autumn, after the second broods are on the wing in August, they tend to collect into parties but remain on the breeding grounds until the middle or end of October. Voous (1960) lists the species as both sedentary and migratory; the birds which inhabit mountains usually descend in winter to lower levels, while the most northerly populations winter in the southern parts of the breeding range. In west China the species extends above 17,500 feet in the subalpine shrub zone; in Europe, however, lower levels are certain y favoured, in Greece from 3,000 to 6,000 feet, in the Alps seldom exceeding 5,000 feet, and in Spain sometimes up to about 8,000 feet but for the most part appreciably lower and at times down almost to sea level.

As its distribution in the Mediterranean area and south Europe in general would suggest, the Rock Bunting requires warmth and sunshine as well as rocks and bushes in its breeding localities, and at least in the northern part of its European range it seeks out warm dry southern or south-western slopes, with oak scrub or other bushy cover, hedges, or patches of young conifers. The slopes are often steep, with rocky outcrops, stony gullies or quarries, and the terrain must be relatively open with a certain amount of bare earth and low vegetation, though preferably a few scattered small trees. Such cultivation as small vineyards, terraced or with drystone walls and stony soil in hilly country, is also accepted. These conditions are best satisfied on the lower mountain slopes. In Spain, where so much of the

countryside is denuded and impoverished, the bird is often found in such bare surroundings as on plate 25a where the nest on plates 24-26 was sited at about 5,000 feet among broom and rosemary (plate 26b).

Géroudet, in the article already referred to, gives an excellent description of the country occupied in the French Alps by this attractive but unobtrusive bird, and his account of its breeding habits adds a good deal to the information recorded in *The Handbook*. In mid-May the area is shared with such birds as Bonelli's Warbler (*Phylloscopus bonelli*), Garden Warbler (*Sylvia borin*), Blackcap (*S. atricapilla*), Blackbird (*Turdus merula*), Robin (*Erithacus rubecula*), Cuckoo (*Cuculus canorus*) and Linnet (*Carduelis cannabina*), with Black Kite (*Milvus migrans*) and Alpine Swift (*Apus melba*) overhead. Amongst so many calls and songs, it is not always easy to pick out those of the Rock Bunting at once. Finally, a thin and sharp *tsi* comes from somewhere in the bushes not far away but out of sight. From time to time the discreet call is repeated, but the bird itself remains invisible until the observer eventually locates it, motionless and watchful, on the topmost shoot of a hazel. After another sharp call it flies off, showing clearly the white outer tail-feathers, to disappear in a quarry.

This is a typical experience. Even where relatively numerous, the Rock Bunting appears only intermittently. Its cries confuse the watcher, and its unexpected departures, frequently to a considerable distance, mislead him. The only way to get on terms is to be as patient and discreet as the bird itself, keeping quiet and still for long periods.

The following is a summary of the results of Géroudet's observations at eight nests. The female alone builds (the male was never seen with nesting material) and she also undertakes the whole of the incubation. When flushed from the eggs or young she often indulges in an injury-feigning display; in this she runs from the nest, spreading her wings occasionally, and appears to somersault over small rocks in her path. Incubation lasts 12-13 days. Both parents feed the brood, seeking food to a distance of about 150 yards, mainly in brushwood. They fly back fairly high and direct with the food, which includes caterpillars and small butterflies, but settle several yards from the nest and complete the journey on foot, climbing slowly over the stones. When leaving again, they fly direct from the nest. The young leave the nest when 10-13 days old, but are still unable to fly for another few days and during this time they hide on the ground, creeping and hopping among the stones and grass. At least sometimes, and perhaps generally, the species is double-brooded. Some of Géroudet's nests were hidden in dry vegetation or sheltered by an earth bank or a stone, and others were very open, placed on the ground, hardly screened by thin grasses and sometimes in the full glare of the sun; none was in thick undergrowth.

On the other hand, the Spanish nest illustrated on plates 27 and 28 was one of two found at heights of three or four feet against the centre trunks of small evergreens five or six feet high. As is rather better shown on plate 24, the nest itself is fairly substantial, the exterior rather loosely built of large stalks of dry grasses, with an inner section of finer pieces more closely arranged, and the cup often lined with horsehair or fine rootlets. In this case the nest was practically on the ground at the base of a clump of rosemary.

The song has been likened by many observers, including Jakobs (1959), to that of the Dunnock (*Prunella modularis*). It is typically uttered from a bare spike at the top of an oak or other exposed tree-top perch, but also from a vineyard stake or a commanding wire. Géroudet gives the period as from early April to July or just into August, with some revival in October. Dandl (1959) in Hungary near Budapest has heard quiet winter song during mild, still weather in an area where breeding does not occur.

In such winter quarters the species occupies habitats frequented by other buntings and finches, Pricam (1957) in the Geneva area mentioning Reed Buntings (*E. schoeniclus*) in particular and an occasional Cirl Bunting (*E. cirlus*), also Chaffinches (*Fringilla coelebs*) and Bramblings (*F. montifringilla*). Voous recalls that in north Africa it is often found in large flocks with Cirl Buntings. European wintering flocks seldom appear to exceed a dozen or so birds; although they may feed with other Passerines, the Rock Buntings maintain contact with each other and separate as a group on taking flight. At this season the habitat may be a less wild one, of hedgerows, fields, copses, bushes and wayside trees, but the birds remain unobtrusive and elusive. As both Pricam and Dandl have noted, they feed on the ground, always within reach of trees or bushes, and if undisturbed they remain quietly for hours in one place. As soon as something unusual occurs, however, one will fly to settle well up in a bush or tree and others will join it, calling their sharp *tzi-tzi* note. Perched thus, their warm orange-brown plumage renders them relatively inconspicuous if a few dead leaves of, for example, oak, beech or chestnut remain on the branches. If further alarmed, they may suddenly swing up vertically into the air and fly a few hundred yards to disappear into cover, or may slip away and vanish more furtively but equally effectively through the branches.

The Rock Bunting is one of the easiest European buntings to identify. The clean, clear-cut grey and black pattern of the head is well brought out in plates 24-28, but black-and-white photographs cannot convey the full contrast between the cold grey of the head and upper breast and the warmth of the rest of the plumage, which is buffish-orange below and black-streaked chestnut-brown above. The rump, showing on plate 27, is chestnut without streaks and the

dark tail has a white outer edge which is often conspicuous. The narrow whitish wing-bar shows well in plate 24. The two sexes are normally substantially similar, having the same basic head pattern, but the female is slightly duller with some dark spots or streaks on the breast and flanks; these can be seen in plates 24-26. Harrison (1957) has drawn attention to the fact that in addition to this male-like plumage, there is a quite distinct and predominantly brown form of female. Young birds closely resemble young Yellowhammers (*E. citrinella*), but have distinctive orange-buff under-parts.

The illustrations this month also include two photographs of the Rock Sparrow (*Petronia petronia*), on plates 29 and 30, while plate 31 shows a breeding area in central Spain. The birds in this instance were nesting in company with Bee-eaters (*Merops apiaster*) in holes in a river bank in pleasant fertile country, which is an unusual type of site and habitat. Colonies are generally found in warm, arid, hilly country, the birds usually nesting in broken, rocky terrain or in ruins, ancient buildings, castles, high bridges, but also in towns, old hollow trees, olive groves, and in wells in semi-desert. The colonies in the old fortifications of Carcassonne in south-west France and in the ruins of Baalbek in Lebanon may be quoted as noteworthy examples.

The world range is similar to that of the Rock Bunting, extending from Madeira to Manchuria, but the Rock Sparrow does not breed in Germany, Switzerland or Austria (although formerly doing so when the summers were warmer and dryer), nor in the Carpathian mountains. It is relatively sedentary, but in winter may wander away from the vicinity of the nesting colony. The birds gather into flocks by late August and in winter sometimes feed in company with finches.

Dresser (1871-1881), who recorded much information about this species, stated that during the autumn and winter its food consists of cereals of several sorts, seeds of wild plants and grasses, and berries of various kinds. During the spring and summer it feeds both itself and its young on insects, including caterpillars and small grasshoppers, later turning to garden fruit and especially cherries. It is more active in its movements on the ground than other sparrows, Niethammer (1937) adding that it does not hop like a House Sparrow (*Passer domesticus*) or a Tree Sparrow (*P. montanus*), but runs like a pipit. In general habits it much resembles the House Sparrow, but it is scarcely as bold as that bird and is less addicted to human habitations and cultivated plains.

The yellow throat patch is a very poor recognition feature at medium range, being often invisible even when looked for carefully under good lighting conditions. The large whitish spots at the end of the rather short tail, on the inner webs of the feathers, are much more helpful. They are not always as evident on a perched bird as might appear from

late 29, but they can show well enough on one which is flying away ow, especially if its tail is fanned, and they are seen to advantage in ne which is clinging at the entrance hole to its nest with its tail spread o give support. The head, however, provides what is probably the est visual guide to the bird's identity, with its broad pale superciliary ripe extending from the eye to the side of the nape. This super-liary is set off by the dark side of the crown, but if the top of the ead is visible an equally distinctive, broad, pale, central band can be en running the length of the crown from forehead to nape, as in a male Brambling or a Lapland Bunting (*Calcarius lapponicus*) in winter. he pattern on the side of the head shows well in the photographs, here the edge of the pale crown-stripe can also just be detected. he general coloration of the bird is otherwise rather like that of a male House Sparrow, but the under-parts (including the flanks) are ell streaked and the under tail-coverts are boldly barred with dull own and whitish. This streaking and barring can be seen on plate .. The sexes are indistinguishable; the young birds resemble their rents, but lack the yellow throat spot.

Apart from plumage distinctions, the calls are diagnostic, the birds a breeding colony persistently uttering a plaintive *wee-eep* or *weel-eep*, communal chirping which is abruptly ended for intervals of silence. can seem a more sibilant *weez-eez* or *weez-wee* when the wheeziness the sound is intensified by echoing out from a rock face. In flight ave rendered it *chee-leep*, more musical than any call of the House arrow.

Debru (1958), who observed the Carcassonne colony in two seasons, ords that pairs were formed and hunting for suitable nesting cavities the second half of April. Display flights included gliding, climbing l parachute descents something after the manner of a Serin (*Serinus arius*). Nest building was in progress in mid-May, and the young the first broods flew between 25th June and 5th July. Second ods were reared in the same nests and flew in August, 40 days r the fledging of the first brood in two cases and 45 days in a third. th parents fed the young.

Dresser described the nest as a somewhat bulky and carelessly con-ucted affair of straw, grass bents, fine roots, wool, hair and bits of , lined with an abundance of feathers. It is built like that of a use Sparrow in holes in rocks, masonry, hollow trees or earth banks. n abandoned House Martins' (*Delichon urbica*) nests are recorded aving been used. The eggs number four to seven, and cannot be inguished with certainty from those of the House Sparrow.

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Notes

Little Grebes attacking Moorhens.—With regard to the recent note by J. B. and S. Bottomley on Little Grebes (*Podiceps ruficollis*) attacking Coots (*Fulica atra*) and domestic ducks (*Anas* sp.) (*Brit. Birds,* 54: 427), it seems worth reporting that I saw several such attacks on Moorhens (*Gallinula chloropus*) on a lake at Alderwasley, Derby, in June 1953. On one occasion two Moorhens were fighting when one of a pair of Little Grebes shot across the surface straight towards them and then dived at a distance of about five yards. Both Moorhens "erupted" in a shower of water and fled for the shore as the head of the Little Grebe appeared between them. Several other attacks on single Moorhens were also noted. Sometimes the Little Grebe remained under water, so that what one saw was the Moorhen suddenly rear up and flee while a swirl in the water indicated a second attack before the Little Grebe showed itself. W. EDMUND HARKER

Fulmar laying egg in Northamptonshire garden.—On 27th May 1961, I was told by my aunt that a "sea-gull" had laid an egg in her garden at Northampton and that the bird was still there. Very dubiously I investigated and to my astonishment I was confronted with a Fulmar (*Fulmarus glacialis*). I captured the bird and released it at Pitsford Reservoir, Northamptonshire, that evening. It settled on the water to preen and bathe before flying off in a southerly direction. The egg, which is now in my possession, was also seen by A. J. B. Thompson and M. Goodman. It is a typical Fulmar's egg, white with a rough surface and slightly pyriform, measuring 73 mm. × 53 mm.

It seems extraordinary that a Fulmar in breeding condition should be so far inland during the nesting season, but this hardly constitutes a breeding record for Northamptonshire! L. S. TAYLOR

Water Rail drowning small Passerines.—At about 1.0 p.m. on 4th January 1962, when there were four inches of snow on the ground but it was not actually snowing, my wife called me to look out of the window of our cottage at Cavenham Mill, near Bury St. Edmunds, Suffolk, at the way a Water Rail (*Rallus aquaticus*) was behaving. A few moments before I had cast out half a pint of crushed oats and crumbs and the Water Rail was making threatening rushes at the House Sparrows (*Passer domesticus*), Great Tits (*Parus major*), Blue Tits (*P. caeruleus*) and other birds which were feeding there. I thought at first that it was just trying to scare them away so that it could have the food to itself, but suddenly it seized what I think was a Dunnock (*Prunella modularis*) in its beak and carried it swiftly down to the edge of the mill-pool some twenty feet from our front door. There the Water Rail stepped into shallow water and held its captive right under until it was dead, whereupon it started to peck at it.

Later the same day, at about 3.0 p.m., I happened to glance out of the window again and saw the Water Rail drowning another bird. This time it seemed to be a hen Chaffinch (*Fringilla coelebs*). The Water Rail was also seen to pick to bits a dead Song Thrush (*Turdus philomelos*) which had been killed by the frost and which we had thrown down on the edge of the pool. ALFRED R. BLUNDELL

[We recently published another note on Water Rails killing small birds (*Brit. Birds,* 55: 132-133) and it seems that such predatory activities are probably less unusual than might have been supposed. Since the earlier note went to press, we have heard from Mr. G. T. Kay whose experience with a Water Rail in his aviary was quoted in the note in slightly different versions from R. M. Lockley's *I Know an Island* (1938, p. 182) and *The Scottish Naturalist* (61: 31). What actually happened was that he came across his Water Rail eating a Chinese Quail (*Excalfactoria chinensis*) and saw it kill a Greenfinch (*Chloris chloris*) with a blow on the skull. An Orange-cheeked Waxbill (*Estrilda melpoda*) and a Snow Bunting (*Plectrophenax nivalis*) were also found dead, but there was no proof in their cases that the Water Rail was involved.—EDS.]

Great Spotted Woodpecker taking thistle heads.—At about 11 a.m. GMT on 28th January 1962, near Woodstock, Oxfordshire, I saw a female Great Spotted Woodpecker (*Dendrocopos major*), which I had previously watched working along a line of trees, drop to the ground in a grass field where there were a number of dead spear thistles (*Cirsium vulgare*) and then fly into an adjacent hedge with a thistle-head in its bill. It wedged the head into a cavity on the trunk of an elder bush and proceeded to hammer at it, fragments flying off as it

did so. I walked up and collected the thistle-head, which was fixed by its base. The woodpecker almost at once picked up another head and wedged it in a field maple a few yards further along the hedge.

I sent both heads, and a third which I picked off the ground, to C. S. Elton, Director of the Bureau of Animal Population, who writes: "The two attacked spear thistle heads had remains of gall structures in but no larvae. The unattacked small head had no gall. G. C. Varley tells me that the Trypetid fly galling flower heads of the spear thistle is *Urophora stylata*. At this time of year galls should have fairly fat fly larvae in, but of course they have parasites."

It therefore seems possible that the woodpecker was looking for gall-fly larvae rather than taking the seeds of the thistle. In both cases the head was taken off the ground, not from a standing plant.

BRUCE CAMPBELL

Swallows feeding on froghoppers.—Recent notes by Bryan L. Sage and H. Dickinson (*Brit. Birds,* 54: 246-247 and 430) have recorded various Passerines feeding on sandhoppers (*Talitrus locustra*). On 11th May 1961, at Eye Brook Reservoir, Leicestershire, my attention was attracted by the antics of five Swallows (*Hirundo rustica*) which were making rapid sorties from the boundary fence and hovering a few inches above the road. They were pecking at something on the metalled surface and were so engrossed that I was able to approach close enough to see that they were, in fact, feeding on froghoppers (*Cercopis spumaria*).

N. L. HODSON

Blackbird recovering from collapsed eye.—Plate 23c shows the head of a first-winter male Blackbird (*Turdus merula*) at Swansea, Glamorgan, on 19th September 1961. It had a large tick on the left side of its head and its left eye had collapsed in such a way that it occupied a region at the rear of the orbital cavity which was otherwise empty. It seemed that the eye had been punctured, perhaps by the bird itself in its efforts to remove the tick. The bird was in good condition and the state of its eye suggested that the accident had occurred in the previous day or so. It was capable of flight, but kept colliding with obstacles on its blind side. We removed the tick and kept the bird for two days, by which time its eye had healed and its sight returned to normal.

M. P. HARRIS

Radde's Bush Warbler in Norfolk.—On the evening of 3rd October 1961, while working through the *Suaeda* bushes at The Hood, Blakeney Point, Norfolk, B.R.S. and R. Harris discovered a large, dark olive warbler, about the size of an Icterine (*Hippolais icterina*). The bird was easily captured in a mist-net and proved to be quite unfamiliar.

The failing light made an accurate appraisal impossible and so it was decided to take it back to Cley where, after being weighed, it was put to roost in a dark box. The following morning it was minutely examined by R.A.R., B.R.S., H.G.A. and P. R. Clarke and found to be a first-winter male Radde's Bush Warbler (*Phylloscopus schwarzi*). This identification was later confirmed by K.W. The following is a summary of the detailed descriptions taken:

Upper-parts: forehead and crown dusky olive; mantle, scapulars and rump olive-greenish-brown tinged oily yellow (shade varying according to light); upper tail-coverts possibly browner; outer webs of tail and wing feathers similar but rather more strongly tinged yellowish-brown, especially the secondaries; carpal joint pale primrose yellow. *Sides of head:* a very broad and heavy dark stripe from lores through eye topped by a long and narrow but clear-cut supercilium of buffish-white tapering to nape; a light crescentic mark below eye served to enhance this striking face pattern; ear-coverts mottled olive and pale yellowish. *Under-parts:* chin and throat pale yellowish-white; sides of breast strongly sullied with olive-grey; flanks similar but tinged buff; belly creamy-white beautifully suffused with primrose; under tail-coverts warm creamy-buff or pale yellow-ochre. *Soft parts:* irides dark brown; bill short, stout and broad at base, upper mandible dark horn with orange-horn cutting edges and lower mandible orange-horn with dusky tip; inside mouth bright chrome-yellow; strong rictal bristles; tarsi, toes and claws yellowish-straw tinged pink. *Measurements:* wing 66 mm., bill (from skull) 12.5 mm., bill width (at gape) 10 mm., tarsus 23 mm., tail (from preen gland) 54 mm. (tips of rectrices pointed and outer ones 4.5 mm. shorter than longest, giving slightly rounded effect); weight (at dusk after transport to Cley) 13.5 gm. *Wing-formula:* 4th primary longest, 3rd −0.5 mm., 5th −1.5 mm., 6th −4 mm., 7th −6.5 mm., 2nd (=9th) −9 mm., 1st 11.5 mm. longer than primary coverts; 3rd to 6th emarginated.

We were particularly struck by the strength of the claws and they had a clinging quality which reminded us of a young Swallow (*Hirundo rustica*) in the hand. To enable as many interested people as possible to see the bird, it was released in R.A.R.'s planted garden aviary till the afternoon. It was then ringed, returned to Blakeney Point and watched among tree-lupins in the sand dunes. It was last seen there at dusk on the following day, 5th October.

In the field it appeared a large, dark, oily-olive leaf-warbler with rather short rounded wings, a longish tail, a dark crown and a heavy blackish line through the eye contrasting markedly with a very conspicuous, long, narrow supercilium of buffish-white which tapered to the nape. This and the short, stout bill gave the head a bold and almost shrike-like appearance. The under-parts showed as pale yellowish, clouded on the breast and flanks with olive, and the vent was a quite distinctive shade of warm buff. The straw-yellow legs looked fairly long. When feeding, it adopted a rather *Sylvia*-like posture, keeping low in the bushes or marram grass and frequently hopping on the sand; it persistently flicked its wings and dipped its

tail in typical *Phylloscopus* manner. In the aviary it took earwigs offered in a china dish and minute flies which it caught in flight or picked from the wire netting, from the perches and from a plate-glass window, but it ignored mealworms and elderberries. It drank freely from an earthenware flower-pot saucer and bathed once. The only note heard at any time was a single or double chat-like *chik* of alarm.

There is only one previous British record of this central and east Siberian species and that was a bird killed at North Coates, Lincolnshire, on 1st October 1898.

R. A. Richardson, B. R. Spence, H. G. Alexander and Kenneth Williamson

[A series of photographs of Radde's Bush Warbler on its Siberian breeding grounds, by Dr. Irene Neufeldt of the Academy of Sciences in Leningrad, appeared in *British Birds* with an accompanying article in March 1960 (53: 117-122 and plates 13-18).—Eds.]

Curious behaviour of Starlings.—At about 2.30 p.m. on 17th September 1961, at Abbots Ripton, Huntingdonshire, I saw a flock of a hundred or more Starlings (*Sturnus vulgaris*) performing in a way which I have never seen before. They were flying at a height of 100-150 feet over a twenty-acre field and going round and round in a clockwise circle about thirty yards in diameter. Individual birds would regularly stop flapping their wings, let their legs hang down and then reach under their bodies with their heads to peck in the direction of their dangling feet. This pecking action would last about four seconds and then the bird concerned would resume normal flight, though still in the circle. It seemed that any one bird indulged in the pecking action about three times each circuit. The behaviour lasted for about twenty minutes and throughout this time the whole flock was silent apart from occasional scolding notes; these were rather like the sounds Starlings make when a cat or other predator is near the nest-hole. Eventually, nearly all the birds returned to the ground and began feeding, though one or two remained in the air and continued this impressive display. I had a good view of them all the time and there was no question of their hawking for flies or any other aerial food. The temperature was 54°F and the day was calm and cloudy with intermittent rain.

Colin Drage

[Mr. Derek Goodwin points out that this behaviour is not unlike that of Black-headed Gulls (*Larus ridibundus*) above a foraging Stoat (*Mustela erminea*). We should be most interested to hear from anybody who has seen Starlings doing this.—Eds.]

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2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and layout are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing systematic lists, reference lists, tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in January 1953 (46: 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Subspecific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1962" and no other, except in tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the layout of the table concerned. It is particularly requested that authors should pay attention to reference lists, which otherwise cause much unnecessary work. These should take the following form:

TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, 42: 129-134.

WITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits*. London. p. 34.

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4. Tables should be numbered with arabic numerals, and the title typed above in the style used in this issue. The title and any headings within the table should not be underlined, because this sometimes makes it difficult for the editor to indicate the type to be used. It is most important that the layout of each table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that tables must either fit into the width of a page, or be designed to fit a whole page lengthways. All tables should be self-explanatory.

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PLATE 32. Long-tailed Tit (*Aegithalos caudatus*), Lancashire, winter 1961 (page 182)
(*J. B. and S. Bottomley*)

British Birds

Vol. 55 No. 5

MAY 1962

Slender-billed Gull in Sussex: a bird new to Britain

By D. D. Harber

ON 19TH JUNE 1960, at the sewage outlet in the sea off Langney Point, Sussex, I saw among Black-headed Gulls (*Larus ridibundus*) an immature gull of about the same size as these but with a markedly longer bill. On this occasion the bird was seen only quite briefly and no other details were recorded, my attention being focused on the remarkable bill. On 22nd June 1960, however, I saw the bird again, in the same place, and pointed it out to R. H. Charlwood who was equally struck by its unusual appearance. On this occasion it was present during the whole of the afternoon, feeding off the sewage outlet, and was watched by us at ranges down to thirty feet, on and off for two to three hours. The description which follows was recorded by us jointly at the time.

The plumage differed little, if at all, from that of a Black-headed Gull moulting from first summer to second winter, except that the browns were paler than in any individual of that species present; there were also greyish markings on the side of the head behind the eye and on the nape. But structurally the bird differed so noticeably that it could at once be picked out at any reasonable range from the first-summer Black-headed Gulls which were with it. The bill was about one third longer than that of a Black-headed Gull and certainly no thinner; in fact, if anything, it was slightly thicker. It had a definite downward curve at the end before coming to a sharp point (this is, of course, the typical shape of a gull's bill, but it was more noticeable in this bird than in the Black-headed Gulls). In colour it was obscurely reddish with a black tip. The neck was distinctly longer and slightly slimmer than that of a Black-headed Gull. The tail also appeared longer, the extra length being approximately that of the (narrow) dark bar at its

end. The bird spent most of the time we watched it feeding or looking for food on the surface of the water at the sewage outlet, and the extra length of neck and tail gave it a different outline from that of the Black-headed Gulls which were doing the same thing; in particular, it appeared to have both ends more depressed. The legs were dark with the under-sides of the feet greenish-yellow.

The structural differences were such that the possibility at once occurred to us that this might be a Slender-billed Gull (*Larus genei*), a species with which neither of us was familiar. But, on reference to the *Field Guide to the Birds of Britain and Europe*, we found it stated that the bill is "*noticeably more slender*" than that of the Black-headed Gull. Nevertheless, I at once wrote to P. A. D. Hollom describing the bird. A correspondence then ensued, as a result of which I learned that the *Field Guide* was incorrect in this respect, and I began to realise that our bird could indeed be of this species.

Meanwhile I had found it twice more, at the same place and under similar conditions, on 6th and 10th July 1960. On the first of these dates I saw it only quite briefly, but on the second I again had long, close views during at least two hours, and was once more struck by the way it stood out among the Black-headed Gulls, still more of which were now present. I also observed that the flight was slightly more buoyant than in the other species. As on previous occasions, the bird was seen only in flight, but for as long and as near as could be wished.

I then visited the British Museum (Natural History) in London and examined six skins of Slender-billed Gulls and also some of Black-headed Gulls. The bills of the former seemed to me to correspond very closely with that of the Langney Point bird in shape and size. The same applied to the length of the neck, allowing for the fact that this is very much affected by the way a skin is prepared. I did not observe any extra length of tail, however. A couple of the skins of immature *genei* had greyish markings on the head in the same places as in the Langney Point bird, though these were distinctly more obscure. On the other hand, there was no skin of a Slender-billed Gull in precisely the same stage of plumage, first-summer, as the Langney Point bird.

By now I was convinced that our bird was a first-summer Slender-billed Gull, but in view of the paucity of available field descriptions, particularly of immatures, I wrote to H. P. Medhurst who has seen many of this species at Aden. In his reply he gave the features by which he distinguishes them in the field. In brief, these consist of the bill "longer and not slimmer than in *ridibundus*", with a "downward curve" at the end; the "head protruding further than in *ridibundus* when in flight"; and the tail "appearing longer than in *ridibundus*", although it is uncertain "whether it is the tail-feathers which are longer

or whether it is the actual hind portion of the body which is longer". He also described the tail as "distinctly wedge-shaped, far more than in *ridibundus*". This last feature we did not notice, perhaps because the contrast with the shape of the tails of the Black-headed Gulls was obscured by some of these being in moult. Otherwise, of course, the structural features identifying the Slender-billed Gull in the field are precisely those which we noted in the Langney Point bird. Medhurst also mentioned the paleness of the markings of immature *genei* (compared with those of *ridibundus*) and added that the dark patch behind the eye varies greatly, being absent in some and prominent in others.

In fact, every feature by which the Langney Point bird differed in plumage and structure from Black-headed Gulls is an identification feature of the Slender-billed Gull. The identification was rendered all the more conclusive by the fact that neither Charlwood nor I had any idea of this at the time when we recorded these features, some of which, so far as I am aware, have never appeared in print before. I have since learned that I. C. T. Nisbet has seen a Slender-billed Gull similar to ours in Greece in August, and that every detail of a first-year bird which I. J. Ferguson-Lees saw in Rumania at the end of May 1961 corresponded with the description which we have given of ours, including the colour of the soft parts.

Recent changes in the habits of the Kittiwake

By J. C. Coulson
Department of Zoology, Durham University
and A. Macdonald

INTRODUCTION

Kittiwakes (*Rissa tridactyla*) are relatively specialised gulls; not only are they adapted to nesting on small rock ledges on precipitous cliff faces (see Cullen 1957), but they are probably the most oceanic of the gulls outside the breeding season, the majority spending the winter over a large area of the North Atlantic and North Pacific Oceans without ever coming to land. Because of these habits, the species does not often come into contact with man. Apart from feeding on the waste from sea-going ships and particularly fishing vessels, it has not, until recently, been associated with civilisation in the way that many other species of gulls will follow the plough, feed on refuse dumps and take food from the hand.

In the last sixty years, however, the Kittiwake has increased considerably as a breeding bird in the British Isles, particularly in England

and Wales, and with this increase there has been a marked change in the type of cliff used for nesting. Recently formed colonies are noticeably lower than the old-established ones and this trend has resulted in the use of cliffs only a few feet high, as well as of window ledges on buildings and even of flat ground (Coulson in press). This has tended to bring the Kittiwake into closer contact with human habitation. Some of the more recent colonies—for example, at Dunbar in East Lothian and at Lowestoft in Suffolk—are very close to, or even actually in, harbours.

In recent years, we have noticed several other changes in the habits of the Kittiwake on the east coast of Great Britain and this paper presents a summary of these observations.

PENETRATION UP THE RIVER TYNE

The River Tyne is tidal for about twenty miles of its length (the upper part only at spring tides and therefore only slightly brackish). Its banks are industrialised and include a wide belt of dense population (Fig. 1). Since it is permissible to put untreated sewage direct into tidal waters, the tidal reaches, particularly from Newcastle upon Tyne to the mouth of the river, are heavily polluted. This part therefore supports a very limited animal population and, in particular, very few fish. Pollution is usually stated to be the sole reason for the decline of the river as a breeding area for Sea Trout (*Salmo trutta*) and Salmon (*S. salar*).

The Kittiwake was not recorded on the Tyne at Newcastle until a single bird was noted in 1951 (Temperley 1952). In the last ten years, however, the position has changed considerably and by 1961 the species could be seen almost daily between February and June within sight of the Tyne Bridge. A.M. has made counts since 1952, usually once a week, of the gulls present on a stretch of almost a mile below the Tyne Bridge, while J.C.C. has independently recorded Kittiwakes since 1958 on the same part of the river. Table 1 shows the seasonal distribution of records between 1952 and 1960. The first Kittiwakes appear at Newcastle at about the same time as they return to the breeding colonies near the river mouth, namely early February. The peak numbers occur just before the majority of the breeding birds start laying (mid-May) and there is then a marked decline during the time most of them are incubating eggs or taking care of young. The last are seen at Newcastle in the middle of July, although many remain at the colonies until the end of September.

The average number of Kittiwakes recorded at each visit between 15th February and 6th June is shown in Table 2 for each year from 1952 to 1960. These particular dates select the season when the birds occur most frequently on the river. While there is no evidence of a

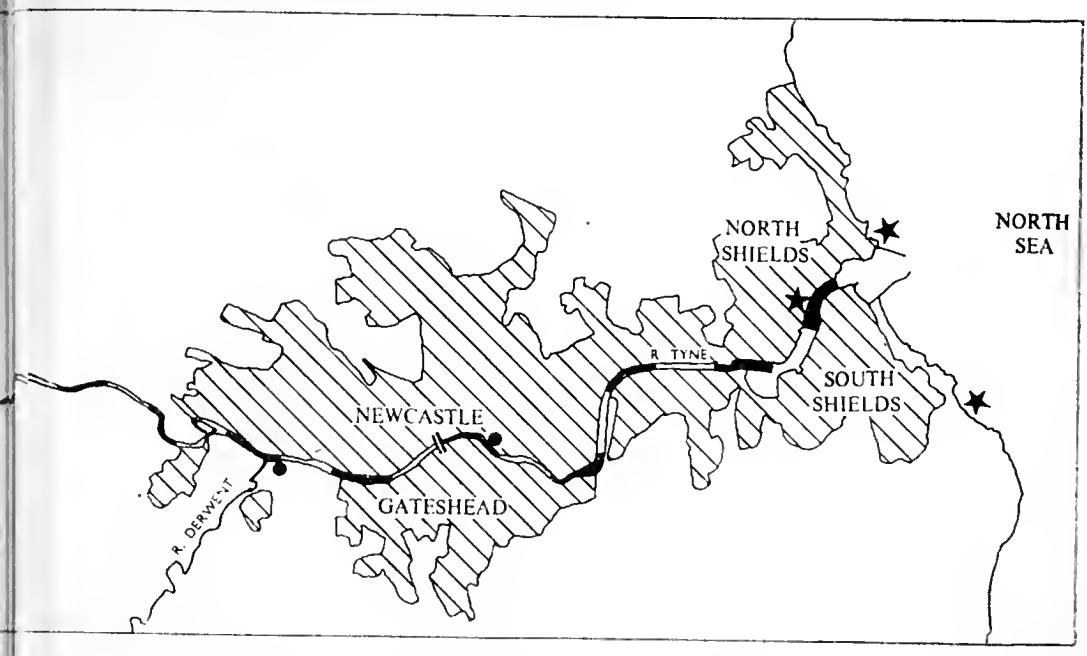

FIG. 1. The tidal reaches of the Tyne, showing the local breeding colonies of the Kittiwake (*Rissa tridactyla*) (★) and the known resting places of this species along the river (●). Alternate one-mile lengths of the river are shown dark to give a scale and the major built-up areas are shaded. The Tyne Bridge is marked under the s of NEWCASTLE

smooth, progressive increase each year, there has been a marked tendency for more to be present in recent years and this is clearly seen from the three-year averages. As already mentioned, it is now uncommon to visit the river between February and early June without seeing at least one Kittiwake.

From 1952 to 1956 only adults were seen (137 in all), but in 1957 two out of 63 were immatures, in 1958 one out of 79, in 1959 seven out of 83 and in 1960 ten out of 96. The percentages of what are mainly one-year-old birds has thus risen from 3% in 1957 to as high as 12% in 1959 and 10% in 1960. There is thus some evidence that an increasing number of immature Kittiwakes are also penetrating far upstream, although the habit apparently originated amongst adults.

On two occasions, J.C.C. also made a survey of the distribution of Kittiwakes upstream from Newcastle. A single bird was seen at the tidal limits near Wylam, and groups of 15 and at least 20 at the mouth of the River Derwent, a tributary of the Tyne (Fig. 1).

Food

Undoubtedly the majority of Kittiwakes seen in the river are searching for food. Both at Newcastle and at South Shields (about two miles from the river mouth), they take very small particles from the water's

TABLE 1—SEASONAL NUMBERS OF KITTIWAKES (*Rissa tridactyla*) ON THE RIVER TYNE AT NEWCASTLE, 1952-60

All counts were made on a 0.9 mile stretch below the Tyne Bridge (Fig. 1) and are summarised here in fortnightly periods. Note that no Kittiwakes were seen before 1st February or after 18th July, in spite of a total of 59 visits at other times of the year

	Up to 31 Jan	1 Feb-14 Feb	15 Feb-28 Feb	1 Mar-14 Mar	15 Mar-28 Mar	29 Mar-11 Apr	12 Apr-25 Apr	26 Apr-9 May	10 May-23 May	24 May-6 Jun	7 Jun-20 Jun	21 Jun-4 Jul	5 Jul-18 Jul	19 Jul-1 Aug	From 2 Aug
No. of visits	13	15	11	16	17	18	14	16	13	15	13	14	15	15	31
Mean no. of birds	0.0	1.6	2.4	3.6	4.0	4.1	3.7	4.4	5.6	4.9	1.1	1.2	0.5	0.0	0.0

TABLE 2—ANNUAL NUMBERS OF KITTIWAKES (*Rissa tridactyla*) ON THE RIVER TYNE AT NEWCASTLE, 1952-60

All counts were made on a 0.9 mile stretch below the Tyne Bridge (Fig. 1), but only those for the peak period from 15th February to 6th June (Table 1) are included here. Note that the three-year averages, both of numbers and percentage observations, show a marked tendency to increase

	1952	1953	1954	1955	1956	1957	1958	1959	1960
No. of visits	5	6	2	9	11	14	24	26	23
Mean no. of birds per visit	1.0	4.0	4.0	4.3	3.2	3.0	5.7	7.1	6.1
		2.8			3.4			6.2	
% visits with birds present		60%			71%			86%	

surface without alighting; some also swim buoyantly and pick up tiny floating morsels after the manner of phalaropes. The river is so heavily polluted that there is little possibility that they are collecting living animal food, and it seems more likely that they are feeding on sewage. This is also suggested by their tendency to accumulate at sewer outfalls and by their habit of following the North Shields-South Shields ferries to feed on materials forced to the surface by the turbulence produced by the twin propellers. It seems significant that this latter type of feeding occurs almost exclusively when the tide is low or on the ebb, for that is when most of the sewage passes downstream.

In the last few hundred yards of the Derwent, which is fresh water, Kittiwakes were feeding almost exclusively on fish taken from just below the surface. We have not been able to identify these, but it was observed that several were over six inches long. Although Common Gulls (*Larus canus*) were as numerous there as the Kittiwakes and were also trying to obtain the same food, it was noticeable that the latter had much greater success.

Resting sites

Kittiwakes have been found resting at two riverside sites near Newcastle (Fig. 1). One is a building about a mile downstream from the Tyne Bridge; we have no evidence of breeding attempts, but more birds occur each year and the site would appear to be suitable for nesting. The other is a wooden quay near the mouth of the Derwent; there is no possibility of nesting taking place there.

It is assumed that the Kittiwakes which occur on the Tyne are mostly from the colonies near the mouth of the river (Fig. 1). All the sixty pairs which breed on the riverside warehouse at North Shields are colour-ringed, however, and since only two colour-ringed Kittiwakes have been seen on the river at Newcastle, it is clear that these are not the birds involved. The colony beside the north pier at Tynemouth consists of only about twenty breeding pairs, but that at Marsden (three miles to the south) contains some 3,000 pairs and probably most of the birds entering the river come from there. However, two Kittiwakes ringed on the Farne Islands have been recovered in the Tyne and so it is likely that some other colonies are involved.

TAKING BREAD

Kittiwakes have for many years had the opportunity of taking bread (and probably have done so) from the waste thrown overboard from ships crossing the Atlantic. In recent years, J.C.C. has observed Kittiwakes regularly taking bread at Dunbar, East Lothian, and at South Shields, Co. Durham. At Dunbar, where there is a colony

nesting on a low cliff on the harbour side, they readily leave their ledges to pick up bread thrown into the harbour or on to the quay-side. This may have developed from the habit of scavenging on the fishing boats lying in the harbour and taking fish from boxes on the boats or the quay. These Kittiwakes will also take small fish ("sprats") which are caught by children in the harbour and thrown down on the quay below the colony.

At South Shields, Kittiwakes can be seen on a freshwater lake, in a park just behind the beach. Originally they came to this lake solely to bathe, but within the last five years some have started to take bread thrown to other birds such as Black-headed Gulls (*Larus ridibundus*), Mute Swans (*Cygnus olor*) and Moorhens (*Gallinula chloropus*). It seems likely that the habit has developed from copying the Black-headed Gulls, but as yet only a minority of the Kittiwakes visiting the lake appear to do it.

OCCURRING IN TOWNS

Kittiwakes normally avoid flying over land except when going to bathe in fresh water or, in the high Arctic, when travelling to and from inland breeding cliffs. These birds now regularly fly over the centre of North Shields to a small reservoir in the middle of the town about a mile and a half from the coast. This reservoir has steep banks, the tops of which are covered with long grass and bushes, and, apart from a small projection in the water, there is no suitable place for them to stand after bathing. They therefore fly to a church near-by and alight on the tower parapet to preen. Thus, during the spring and summer, it is possible from one of the main streets in North Shields to see Kittiwakes standing on a church tower.

DISCUSSION

Although the Kittiwake can be considered a specialised gull, this has not resulted in a lack of adaptability. In recent years it has started to nest on flat ground (Salomonsen 1941) and has shown a change in the type of cliff used for colonies (Coulson in press), while the present paper has demonstrated that the species is now penetrating inland and also exploiting new food materials.

It may be valuable to consider some of the possible effects of these changes in habits. During the last hundred years there has been a considerable increase in the occurrences of several species of gull inland in this country. It is possible that the Kittiwake may be beginning to show the same trend. While this bird probably depends more on fish for its food than the other gulls, there is now a tendency for it to feed with greater frequency on such materials as sewage and bread. In addition, it is probably for the first time feeding regularly

on fish caught in freshwater. These changes may spread during the next few years and the Kittiwake may occur more commonly on fresh water during the breeding season.

Linked with these developments is the possibility that the Kittiwake may start to breed inland. There has been a colony on the River Tyne at North Shields, some two miles from the sea, since 1949. The formation of a new colony is usually heralded by a number of individuals using the site for some years as a resting place. Resting sites are already in use at Newcastle, some ten miles from the river mouth, and in the centre of North Shields. Kittiwakes have nested on window ledges of buildings in Great Britain since 1935 and they have recently started to breed on sloping roofs in the Lofoten Islands off the coast of Norway (Wagner 1958); such habits must greatly increase the number of possible nesting sites available for the species.

This discussion is obviously speculative, but it is considered important to draw attention to these changes so that, if they extend to other areas, the spread can be recorded in detail.

SUMMARY

Since 1951, Kittiwakes (*Rissa tridactyla*) have occurred regularly on the River Tyne at Newcastle, ten miles from the river mouth. They are present from February until mid-July and systematic counts have shown that the numbers are increasing. Food appears to be the cause of this new habit and the birds tend to congregate at sewer outfalls or where ferries make the water turbulent. Further upstream from Newcastle, Kittiwakes have been seen to take fish from fresh water in the River Derwent, a tributary of the Tyne. Kittiwakes have also been recorded taking bread from human beings at Dunbar and South Shields, and standing on the top of a church tower in the centre of North Shields well away from the sea. It is suggested that these new habits could produce a marked change in the ecology and breeding distribution of the species.

ACKNOWLEDGEMENTS

We should like to thank Dr. L. Davies for critically reading the manuscript and making several helpful suggestions.

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Mortality and weights of Fieldfares in Anglesey in January 1962

By P. Hope Jones

The Nature Conservancy

FIELDFARES (*Turdus pilaris*) are regular winter visitors to Anglesey as a whole, and in mid-October 1961 large numbers of these and other thrushes arrived in the county. Sightings of Fieldfares on Newborough Warren National Nature Reserve and in the adjacent Newborough Forest, both in the south of the island, are relatively infrequent, however, and, apart from a few flocks in October, only three individuals were noted in those areas in the 1961-62 winter until the very cold spell in early January.

The relatively heavy snowfall of 30th/31st December had been preceded by several days and nights of very hard frost, and conditions were particularly severe for most land birds; there were several local reports of dying thrushes—Redwings (*T. musicus*) in particular—and finches. On 2nd January numerous thrushes were seen on the edge of the Cefni Estuary salt marsh, which lies between Malltraeth and Newborough Warren, and the following morning an attempt was made to catch some. It was found that a flock of about 150 Fieldfares, accompanied by a few Redwings, Song Thrushes (*T. philomelos*) and Mistle Thrushes (*T. viscivorus*), was feeding on the berries of sea buckthorn (*Hippophaë rhamnoides*). These buckthorn bushes had been cut down in late November, and the birds were having to feed on or very near the ground. As a result, they were relatively easy to trap in mist-nets, and twenty-nine were soon weighed, ringed and released. Several were apparently so weak that they were unable to fly and these were caught by hand, weighed and released without being ringed. Only a few freshly-dead individuals could be found, but small patches of feathers in the snow told their own story. Doubtless many dead and dying Fieldfares were eaten by the attendant Carrion Crows (*Corvus corone*), and possibly some were taken by other predators—it was known, for example, that a Merlin (*Falco columbarius*) and a Hen Harrier (*Circus cyaneus*) frequented that locality. From the warmed patches and droppings, it was evident that many Fieldfares had been roosting under clumps of marram grass (*Ammophila arenaria*) in the adjacent sand dunes, and here too were the familiar patches of feathers showing the activity of predators. Many more birds could have been caught, but netting was discontinued to minimise disturbance.

A thaw began on 4th January, and was well under way by the following day when another short session with the nets produced a further eleven birds. By this time they were able to feed over much of the salt marsh and the flock had dispersed to a large extent. Again a few weak individuals were found; five of these apparently starving birds were picked up, warmed and fed, but all except one died within three days. The site was visited again on 7th January, but by this time all the Fieldfares had disappeared from the area.

A pointer to the amount of subcutaneous fat on a Passerine can be obtained by inspection of the bird's tracheal pit. In none of the dead Fieldfares, and in only one of the weakened ones, was any fat visible at all. Of those trapped, roughly half were without any trace of subcutaneous fat in the tracheal pit and all were very emaciated.

From unpublished observations I made in the Camargue, southern France, it seems that in the presence of a good food supply the weights of wintering Reed Buntings (*Emberiza schoeniclus*) tend to rise with falls in temperature; similarly, from North American data, Helms and Drury (1960) concluded that winter weight changes in American Tree Sparrows (*Spizella arborea*) and Slate-coloured Juncos (*Junco hyemalis*) were temperature dependent. This tendency appeared to hold good in the Blue Tits (*Parus caeruleus*) and Robins (*Erithacus rubecula*) which frequented the houses at Malltraeth during the cold spell: six Robins and sixteen Blue Tits trapped between 1st and 7th January all showed thick deposits of fat in the tracheal pit and around the belly, and were relatively heavy. The average weights of the Fieldfares might also have been expected to rise during the cold spell, but the weight change was, in fact, reversed because of the great scarcity of food. From the corpses and feather patches counted, it is thought that the actual mortality in this particular flock was between 10% and 20%, and there is every reason to believe that, had the cold weather and snow cover continued, many more would have died.

The series of fifty-eight weights of birds in this flock showed an interesting picture. Four groups were readily distinguishable and the average for each is shown in Table 1.

TABLE 1—WEIGHTS OF DEAD, WEAK AND MORE VIGOROUS FIELDFARES (*Turdus pilaris*), ANGLESEY, JANUARY 1962

	Number	Average weight
Freshly dead	4	58.2 gm.*
Too weak to fly	14	63.4 gm.
Stronger (3rd January)	29	78.0 gm.
Stronger (5th January)	11	84.5 gm.

*In the light of the picture presented by all the other weights, it is considered that one dead bird which scaled 82.7 gm. probably died from causes other than starvation and this record has therefore been omitted from this calculation.

There seems to be very little information available on normal weights of Fieldfares in Britain, but the average of five autumn birds on Great Saltee (Co. Wexford) was 96.24 gm. and a longer series from Fair Isle gives some idea of the range which can be expected. In the latter case, the distribution of weights of thirty-seven birds identified as males did not differ significantly from that of thirty-two identified as females ($p>0.10$) and the combined mean was 98.26 gm. ($s=9.97$). It would seem, therefore, that an average of between 90 gm. and 110 gm. might reasonably be expected for autumn migrant Fieldfares. The mean weights of the Anglesey birds compare very unfavourably with these figures: those trapped were in general about one-fifth less, and the weak and dying as much as a third. One very interesting Fair Isle record (not included in the above calculations) was that of an adult male noted as "dying of starvation" at 58.7 gm.—very near the Malltraeth average of dying birds. The weights given by Ash (1957) for eleven Fieldfares found dead in the cold spells of 1954 and 1956 averaged 55.9 gm. and more recently, during this same January, Harris (1962) found that twenty-five corpses on Skomer Island, Pembrokeshire, averaged 58.4 gm. When these figures are taken in conjunction with the Malltraeth average of 58.2 gm. and the single Fair Isle weight of 58.7 gm., it seems probable that the minimal weight for this species may be just under 60 gm.

The increase in the mean weights of the Malltraeth birds from 78.0 gm. on 3rd January to 84.5 gm. on 5th January is significant ($p<0.01$) and was almost certainly a result of the amelioration in the weather, which allowed the birds to feed over a much bigger area and on a wider variety of foods on 4th and 5th January.

Of four Fieldfare corpses examined for endoparasites, only one was found to be infected and that by a single Nematode, probably *Ascaridia galli*.

ACKNOWLEDGEMENTS

I am indebted to Peter Davis and Kenneth Williamson for providing weight data from Fair Isle and Great Saltee respectively, and to I. Herbert and W. Threlfall for their examination of the Fieldfare corpses.

SUMMARY

(1) Observations were made on a flock of 150 Fieldfares (*Turdus pilaris*) near Malltraeth, Anglesey, during hard weather in early January 1962.

(2) All the birds handled were very emaciated, and there was a mortality of between 10% and 20%.

(3) The weights of the trapped birds averaged about one-fifth, and the weak and dying about one-third, lighter than the average of sixty-nine autumn migrant Fieldfares at Fair Isle.

(4) A significant increase in the average weight of trapped birds was noted after the thaw had made more food available.

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More examples of the best recent work by British bird-photographers

(Plates 32-40)

IN THIS ISSUE we are publishing our third annual selection of the best contemporary work by British bird-photographers (*cf. Brit. Birds*, 53: plates 25-32; and 54: plates 27-34), the main object being to keep a permanent record in one place as a yardstick for the future. It must be remembered, however, that a number of the best recent photographs, particularly of less common species, appear in this journal in the normal course of events. Some of those which have been published in our "Studies of less familiar birds" in the last year, or which are scheduled to come out in that series quite soon, would certainly otherwise have been included here. In this connection we should particularly mention the Bonelli's Warblers (*Phylloscopus bonelli*) by M. D. England (*Brit. Birds*, 54: plates 62-64) and the Rock Buntings (*Emberiza cia*) by K. J. and R. G. Carlson, Arthur Gilpin and H. R. Lowes (*Brit. Birds*, 55: plates 24-28).

The main selection was made at the Autumn Nature Exhibition of the Royal Photographic Society, but we have also kept a careful watch on photographs circulating in the folios of the Zoological Photographic Club and the Nature Photographic Society, as well as those published in various books and magazines, and we do appeal to all photographers to send in prints which they consider might have a chance of inclusion. We wish to encourage the newcomer while not overlooking the work of the long-practised photographer to whom the novice owes so much, and we like to vary the species as much as possible. Some birds are far more difficult to photograph than others, not because they are rare but because of their general temperament, their shyness at approaching the nest or their suspiciousness at coming down to bait. A prize example of this is the Magpie (*Pica pica*) which had probably not been successfully photographed at the nest on more than half a dozen occasions before Morley Hedley achieved it in April 1961 (plate 35).

This is the first occasion in these annual selections that we have published two photographs by one photographer or, in this particular case, by one pair of photographers—Mr. and Mrs. J. B. Bottomley. Husband and wife do their photography jointly, taking turns in the hide and sharing the dark-room work. Their Long-tailed Tit (*Aegithalos caudatus*) (plate 32) and Great Spotted Woodpecker (*Dendrocopos major*) (plate 34) were both taken at feeding places in their woodland garden, thus emphasising that there is no need to travel great distances to secure successful photographs. ERIC HOSKING

Obituary

Alfred Hazelwood (1913-1961)

ALFRED HAZELWOOD died on 7th December 1961 at Bradshaw, near Bolton, Lancashire. He had returned home on 23rd November after spending five weeks at the Manchester Royal Infirmary, where his condition had been found to be inoperable.

Born at Doncaster on 30th April 1913, he matriculated at Doncaster Grammar School, held a Studentship for two years at the Bird Room of the British Museum (Natural History), and in the early thirties became Assistant at the Doncaster Museum and Art Gallery. He relinquished this post in 1935 to be Assistant Curator at the Chadwick Museum, Bolton. Appointed Curator to the Bolton Museums and Art Gallery in 1957 by unanimous vote, without the vacancy having been advertised, he was subsequently responsible for considerable improvements such as the complete reorganisation of the Art Gallery, the establishment of a Cotton Machinery Museum at Tonge Moor and the taking over of Smithshills Hall.

In 1939 he married Ellen Gallwey, who was then Assistant Curator of the Tolson Memorial Museum at Huddersfield. She being a herpetologist and generally interested in all branches of natural history, their interests were so much intertwined that it proved to be a perfect partnership.

He saw service with the Royal Navy in the Second World War, attaining the rank of Lieutenant R.N.V.R. During a commission in the Northern Isles he met the late Samuel Bruce of Lerwick, with whom he struck up a mutual friendship. As he never forgot a kindness, it was a measure of his appreciation that after hostilities had ceased he coaxed "Sammy" out of his native Shetland for the first time and set about showing him as much as possible of English and Scottish bird life.

It was also during his period of service with the navy that he and I met. A day out from Scapa with an arctic convoy, I was handing over

the watch to him and casually remarked (without knowing of his interest in birds) that the Fulmars were getting darker. He replied, with a quick look, "Yes, we shall see more of them as we get further north". Thereafter, until things became too "busy", he would leave me a perfect near-life-size pencil drawing whenever he handed over the watch. The first time it was of a Fulmar and there followed a Partridge, a Peregrine and so on. Thus began a friendship which grew ever stronger with the years.

Hazelwood joined the Yorkshire Naturalists' Union in 1940 and was President in 1958. He became a member of the British Ornithologists' Union in 1935, and in June 1959 he was invited to join the Rarity Records Committee of *British Birds*. In 1961 he was elected President of the North Western Museums, and for years he was on the Lancashire and Cheshire Fauna Committee. His chosen sports were few, but he had a deep love of wildfowling and would give a good account of himself after a long spell of abstinence. Lately he derived much pleasure from village cricket, being Chairman (and a pitch-roller) of the Bradshaw Cricket Club from 1959.

Although birds were his chief love, he took an untiring interest in natural history as a whole. In the field he was a wonderful companion and if, as can so often happen, the intended bird did not turn up, the day was never dull, interest being unobtrusively switched to Natterjack Toads, Edible Snails, dragonflies, ferns, the flora of the limestone pavement, or anything else that offered. He was dedicated to his work and yet would always gladly find time to give a helping hand to anyone from the very young upwards if they showed an honest desire to learn. Fools he suffered none too gladly, albeit quietly and without outward flurry. If a speaker clashed with him, he would cast a penetrating look, more of surprise and pity than of annoyance, and then the other would be passed by and forgotten astern. His opinions he voiced forthrightly in the face of all opposition. Above all, however, he was essentially a kindly man, unobtrusive with his wide knowledge and with an abounding sense of humour of a deliciously dry type. His passing leaves a gap which can never be filled.

His most devoted wife survives him, as do their daughter, Margaret, and their three sons, John, Philip and Anthony, to all of whom the deepest sympathy is extended. A.L.W.M.

Notes

Wilson's Phalarope in Cornwall.—Early on the morning of 15th June 1961 J.E.B. came across an unfamiliar medium-sized wader with plain brown upper-parts and a dull white rump and tail, on Marazion Marsh, Cornwall. He contacted Dr. G. Allsop and between them they

watched the bird for about five hours. N. R. Phillips was then told and he and R. Khan saw it that evening. Two days later it was found independently by W.R.P.B. and J.L.F.P., and subsequently a number of other observers went to see it. It was last recorded with certainty on 4th July. It was recognised as a species of phalarope by its characteristic position when swimming and by the delicate proportions of its head, neck and bill, while its relatively large size, comparatively drab coloration and distinctive face-pattern together proclaimed it a male Wilson's Phalarope (*Phalaropus tricolor*). The detailed description which follows is based mainly on that obtained by W.R.P.B. and J.F.L.P. on 17th June, but the notes made by J.E.B. and others agree well with it:

> An unusually large, long-legged, long-billed phalarope, perhaps approximating in size to a small Reeve (*Philomachus pugnax*) or a Wood Sandpiper (*Tringa glareola*), and behaving rather like those species, feeding mainly by wading along the shore rather than swimming, and having a loose, erratic, wavering flight. Forehead, crown and hind-neck ash-grey with an inconspicuous paler longitudinal patch on the nape. Rest of upper-parts except rump and tail grey-brown, appearing uniform in flight, but showing darker feather centres (especially on the scapulars) on the ground. Rump and tail off-white in flight, the tail actually slightly more brownish-grey but without any well-defined dark tip. Supercilium white, broadest over and just behind the eye, where it ceased abruptly, with a fairly broad, blackish stripe running from the bill through the eye and curving down to merge with the markings on the side of the neck. Chin white, contrasting markedly with warm-buff sides of neck, vinous-buff fore-neck and upper breast, pinkish-buff sides of lower breast and buff flanks, the last faintly marked with brownish streaks. Central under-parts white, and under-wing whitish or pale grey. Eye dark. Bill black, straight and very slender, considerably longer than head, markedly longer than in other phalaropes. Legs rather long, dark, but upper tibia paler, possibly yellowish. Feet black, protruding beyond tail in flight, the toes apparently slightly lobed.

Although tamer than many waders, it was not quite so confiding as most Grey or Red-necked Phalaropes (*Phalaropus fulicarius* and *lobatus*) frequently are. When approached to within 25-30 feet it normally flew off quietly to another part of the same pool and sat there, later returning to the original area to feed in muddy water less than six inches deep. On the 15th it frequently associated with a Ruff and was then comparatively unapproachable, flying up at the same time as the Ruff, but not always accompanying it; it would then even fly high and circle. It usually waded up to its belly, but swam freely in deeper water, holding its head and neck well up and its tail depressed, the tips of the closed wings extending just beyond the tail. It fed by picking small objects from the surface all round, and also by sweeping the bill from side to side with the tip submerged, but apart from a couple of half-hearted turns it was not seen to spin. In general its behaviour was rather subdued and it did not call.

While it presented no particular difficulties of identification, the

VII 33. Bee-eater (*Merops apiaster*), France, May 1961 (pages 181-182) *N. C. Porter*

PLATE 35. Magpie (*Pica pica*) at nest, Yorkshire, April 1961 (page 181) (*Morley Hadley*)

34. Female Great Spotted Woodpecker (*Dendrocopos major*), Lancashire, April 1961 (*J. B. and S. Bottomley*)

PLATE 36. Blackbird (*Turdus merula*) and Starling (*Sturnus vulgaris*), Glamorgan, December 1960 (*C. Stockton*). Below, Knot (*Calidris canutus*) and Redshank (*Tringa totanus*), Denmark, August 1957 (*C. C. Doncaster*)

PLATE 37. Immature Ringed Plover (*Charadrius hiaticula*), Cheshire, August 1901
(*D. M. Turner-Lettsbinger*)

PLATE 38. Female Kestrel (*Falco tinnunculus*), Norfolk, June 1959 (*R. Jones*)

PLATE 39. Female Pintail (*Anas acuta*), Hebrides, June 1961 (*L. H. Inspeaw-Cunda*)
Female Red-breasted Merganser (*Mergus serrator*), Cumberland, June 196
(*E. K. Thompso*)

PLATE 48. Barn Owls (*Tyto alba*), Ayrshire, October 1961 (*William A. Paton*)
Below, Little Gull (*Larus minutus*) at nest, Denmark, June 1960 (*Guy B. Farrar*)

combination of a long, needle-like bill and contrasting face pattern at rest and the presence of a plain wing and dull white rump in flight being very distinctive, it did differ in several respects from the illustration of a male Wilson's Phalarope in P. A. D. Hollom's *The Popular Handbook of Rarer British Birds* (1960). In particular, the bill seemed longer, the upper-parts paler and more uniform brown, and the neck less chestnut, while the paler patch on the nape, at the time thought to be a plumage aberration rather than a normal character, was much less distinct than in the illustration. The generally drab coloration and the presence of streaks on the flanks suggest that it may have been a first-summer bird.

J. E. BECKERLEGGE, W. R. P. BOURNE and J. F. L. PARSLOW

Wilson's Phalarope in Nottinghamshire.—On 16th July 1961, at about 9.0 a.m., P. Hope and W.P. saw an unusual wader on the Burton Meadows area of Nottingham Sewage Farm. Later in the morning they met E.T.L., A. W. Preston and Richard Preston and took them to see the bird which was then swimming on open water in the manner of a phalarope (*Phalaropus* sp.). They all made notes, and returned home to compare them with descriptions in *The Popular Handbook of Rarer British Birds* (1960). In the afternoon E.T.L. and W.P. with D. J. Young and P. Carr found the bird again, and obtained sufficient details to confirm it as a Wilson's Phalarope (*Ph. tricolor*). Early the following morning it was seen by Mr. and Mrs. A. Dobbs and C. A. Johnson, and during the next ten days by a total of about thirty people. It was last recorded on 28th July. The descriptive notes below have been summarised from the observations of all those mentioned above.

In general appearance the whole bird was very white, this being striking even at a distance and making it stand out from all other waders. Its under-parts were gleaming white, but above it was actually very pale grey with the primaries perhaps a little darker; the forehead, crown and nape were paler grey than the mantle, back and wings; the rump was white and the tail was also very pale; a dark smudge extended behind the eye. It had a slender neck, smallish head, fairly long and very thin bill, and slender legs; both bill and legs were black. It was a typical phalarope in shape and action, but larger than either Red-necked or Grey (*Ph. lobatus* and *fulicarius*), being only a little smaller than a Redshank (*Tringa totanus*). When standing on the mud or in shallow water, it seemed very tall in comparison with, say, the Dunlins (*Calidris alpina*). It spent much of its time swimming and held its head very upright as it did so; this made it look longer-necked than other phalaropes and it had something of the appearance

of an immature Little Gull (*Larus minutus*). As it swam about, it would move its head from side to side, or twirl its body in a semi-circle, and snap at insects on the surface of the water. It actually seemed to prefer the water to the land, but it was sometimes seen on the mud of the sewage tanks or on adjacent plough or grassland with such waders as Redshanks, Dunlins, Ruffs (*Philomachus pugnax*) and Lapwings (*Vanellus vanellus*); Green and Wood Sandpipers (*T. ochropus* and *glareola*) were also in the area for comparison. It was never heard to make a sound and was always fairly shy compared with Red-necked and Grey Phalaropes, flying off when the Redshanks did. In flight it had a plumpish torpedo-shaped body and the square white rump was very prominent, particularly as the plain grey wings (no wing-bar) seemed darker than when it was at rest; the wings looked rather rounded. E. T. Lamb and W. Priestley

Wilson's Phalarope in Co. Wexford.—A Wilson's Phalarope (*Phalaropus tricolor*) in almost complete winter plumage was identified at Lady's Island Lake, Co. Wexford, on 12th and 13th August 1961. It was first seen by me on the 12th and, as a result of a telephone call, B. D. Cooper, S. Holohan and Major R. F. Ruttledge joined me on the following day. Together we had the bird under observation for one and a half hours. At the end of that time, for no apparent reason, the Dunlin (*Calidris alpina*) with which it had been feeding began to leave the lake in small parties; and with one such group the Wilson's Phalarope departed and did not return. The following description was made under excellent conditions of light and weather, at various distances down to about thirty yards:

> Noticeably larger than Dunlin and smaller than Black-tailed Godwits (*Limosa limosa*), both of which were seen near-by; about the size of, or a little smaller than, a Redshank (*Tringa totanus*). Bill black, straight and thin—quite needle-like—and between 1¼ and 1½ times the length of the head; legs and feet looked black, though once R.F.R. thought he detected a greenish-yellow tinge on the front of the tarsus; eye dark. Head small and dainty, neck rather long and noticeably slender; body slender (but in certain attitudes rather "full-breasted") and tapering towards tail. Forehead white; crown and nape very light grey-brown; fairly noticeable white superciliary above a short, dark and not broad line running backwards for a quarter to half an inch behind the eye. Cheeks, chin, throat, sides of neck, breast, flanks, belly and under tail-coverts all an unmarked and delicate off-white, appearing very white at any distance at all. Back of neck light greyish-brown, contrasting with the white sides of the neck and giving a "maned" effect; mantle and back a soft, unmarked, pale greyish-brown; rump, upper tail-coverts and tail (except tip which had irregular brown marks) pure white. Primaries dark grey-brown in marked contrast to body colour; scapulars, wing-coverts and secondaries light greyish-brown, at some angles looking almost pure grey.

In flight, the neat white rump and upper tail-coverts produced a pattern recalling a Wood Sandpiper (*T. glareola*), while at certain angles the mantle and upper wings looked quite brown (there was no wing-bar whatever); the under-wings were white; the feet projected beyond the tail, and we thought that just the bases of the tarsi did so as well. In general, it was a strikingly white wader that, even at two hundred yards or more with the naked eye, stood out from the Dunlin like a Sanderling (*Crocethia alba*) in winter plumage. It fed ashore nearly all the time (no "spinning" was seen) and was very active, constantly rushing about in a darting fashion and rapidly picking food from the surface of the shallow water or mud. It had a strangely crouched posture with its body at about 30° to the ground, its neck and head more nearly horizontal and its tail rather raised. No call was heard. It should be noted that, though the bird was apparently well into winter plumage, its leg colour had not yet reached the pale state of that season. O. J. MERNE

[These are the sixth, seventh and eighth records of this North American wader in Britain and Ireland, which seems remarkable when one remembers that the species was only added to our list as recently as 1954 (*Brit. Birds,* 48: 15-17). In the eight years since then it has occurred once in May, twice in June, once in July, twice in August and twice in September, in widely scattered places in all four countries. The lack of any overlap in the dates of the three 1961 records raises the possibility of a single bird wandering from Cornwall to Nottingham and thence to Wexford, changing from summer to winter plumage in the course of the eight weeks concerned. However, a comparison of the descriptions, especially of notes on size and behaviour, suggests that at least two different individuals were involved.—EDS.]

Food of tits.—A recent note by Bryan L. Sage on the food of the Marsh Tit (*Parus palustris*) (*Brit. Birds,* 55: 89) reminds me that, where tits and the seeds of Compositae are concerned, things are not always what they seem. In August 1947, at Flatford Mill, Suffolk, during a bird course organised by me, several Goldfinches (*Carduelis carduelis*) were being watched one afternoon at a range of about 25 feet as they fed on the seeds of greater burdock (*Arctium lappa*) growing along a rough hedgerow; two Marsh Tits joined them and all were busily attacking the heads and scattering the down. It was noticed that, when the Goldfinches extracted beakfuls of pappus, they rolled it between their mandibles for a few seconds before discarding it; whereas, when the Marsh Tits plucked out pappus, they dropped it

immediately. One of the exercises of the course was to collect (after careful observation) the remains of any food material on which a bird had actually been working. In this instance bundles of pappus seen to have been discarded by (a) Goldfinches and (b) Marsh Tits were collected separately. It was found that the former had been severed immediately above the seeds as neatly as by a pair of scissors, while those thrown away by the Marsh Tits had their full complement of seeds untouched. Further investigation showed the heads to be infested with small orange-pink larvae about three millimetres long; there were up to twenty in a head, living at the base of the pappus among the seeds, and it was noted that the heads partially stripped by the Goldfinches appeared still to contain their full quota. While it could not be claimed that the Marsh Tits were actually *seen* to be extracting and eating the larvae, clearly they were not interested in the *Arctium* seeds. Small larvae (? Cynipidae) can be found similarly in the heads of thistles (e.g. *Cirsium palustre* and *vulgare*) and, indeed, in many other plants.

A parallel observation concerned a Great Tit (*Parus major*) and a turkey oak (*Quercus cerris*). The Great Tit was watched working along the twigs of the tree and gently tapping the acorns. Now and then it would concentrate its attention on a particular acorn, evict it from its capsule and immediately follow it down to the ground; there the acorn was broken up and its contents devoured piecemeal. One might have assumed that the bird was eating the kernels, but when the actual remains were collected (including one nearly intact acorn from which the tit had been suddenly frightened away) it was found that the acorns were full, not of kernel, but of five to seven weevil larvae, each in its own round cell and between them filling to capacity the entire space within the shell—a good meal.

One further incident can be added, involving a Blue Tit (*P. caeruleus*) which profited from the exertions of a Lesser Spotted Woodpecker (*Dendrocopos minor*). The latter, a resident male, was often to be seen opening up the long swollen stem-galls on willows (*Salix*). As it passed from branch to branch, it would frequently be followed, at first or second remove, by what was probably the same individual Blue Tit which then took its turn in searching and pecking at the broken gall. These galls were found to contain larvae of various sizes from less than one to over four millimetres in length (whether different ages of one species of gall wasp or of different inquilines is not known). It seems likely that the very small larvae might be too minute to interest the woodpecker, but a profitable investment for the tit.

E. A. R. Ennion

Blackbirds rearing five broods in one season.—A pair of Blackbirds (*Turdus merula*) nesting in Queen's College, Oxford, in 1961 laid their first clutch in January and went on to raise five successful broods totalling at least fifteen, and almost certainly sixteen, young. The first brood was reported by Mr. A. C. Larke of Queen's College to Dr. Bruce Campbell and it is believed the nestlings hatched on 7th February. The first four broods were all reared in one nest and the fifth in a second, both being old ones remaining from the previous year and situated some five yards apart on sheltered ledges of the college building. Details of each brood are summarised below (when events were not observed, data were estimated and are shown in brackets):

First brood. (1st egg 23rd January): (clutch 3 eggs): (hatched 7th February): 3 young (8 days old) 15th February: 1st young left 23rd February: other 2 young left 24th February.

Second brood. (1st egg 4th March): 3 eggs 8th March: 2 eggs and 1 very small young 19th March: 1 egg and 1 young 28th March: (young left 3rd April): young near empty nest 4th April.

Third brood. 1st egg 11th April: 5 eggs 19th April: 3 eggs and 2 young 27th April: 4 young 6th May: (young left 11th May): 4 young near nest 12th May.

Fourth brood. (1st egg 18th May): 5 eggs 24th May: (hatched 2nd June): 5 young (4 days old) 6th June: 2 young in nest and 3 young near-by 18th June: nest empty 19th June.

Fifth brood in different nest. Lining about 26th June: 1st egg 28th June: 4 eggs 2nd July: 3 eggs and 1 young 12th July: 1 egg (chipping) and 3 young 13th July: 4 young 25th July: 1 or 2 young left 26th July: 1 young dead in nest and 2 young near-by 28th July.

There is no reason to doubt that all five broods were raised by the same pair. The hen was exceptionally tame and in the later part of the season would fly to the nest on seeing anyone approach; she then had to be lifted off and would sit on the back of one's hand and peck at while the contents of the nest were examined.

The winter of 1960-61 was unusually mild and damp, and several nests of Song Thrushes (*Turdus philomelos*) were reported in December. During the five days prior to 23rd January (when the Blackbirds' first egg was probably laid) the minimum grass temperature never fell as low as freezing point. The weather throughout February and March was exceptionally mild, with only two days with frost in February; however, there were two short spells of cold in March and these could have resulted in the poor success from the second brood. 1961 was a year of early breeding for a variety of species.

The Blackbirds fed largely on a college lawn near the nest. The fact that the lawn was kept watered undoubtedly helped them to find worms, but even so it became hard in warm weather and they then foraged elsewhere, possibly having to go considerable distances.

Between 4th May and the second week of July Oxford had virtually no rain, except for one inch which fell on 12th June; during this time many young Blackbirds starved in other nests under observation and comparatively few new clutches were begun. That the college birds had difficulty in finding food is suggested by the long fledging periods. Although the last brood took less time than the earlier ones, the hen was noted as being very thin on 21st July, feeding visits were rather infrequent and the cock (already moulting his tail-feathers) fed the fledged young on bread. One young in this brood died when fully-feathered and a second, known to have reached flying age, was unaccounted for.

We know of no other certain case of five broods being successfully reared in one season. However, four appear to be raised not infrequently. A record in *The Countryman* (55: 46) tells of a pair which lost their first brood late in the nestling period and went on successfully to rear four further broods, each of three young. Two nest record cards received by the British Trust for Ornithology for 1960 give instances of Blackbirds producing four broods: in one case a fifth brood may have been reared but the evidence was not conclusive; the other pair made seven nesting attempts, from four of which young were fledged. Finally, there are at least two records of four broods in this journal (*Brit. Birds,* 40: 85 and 48: 93): the second of these pairs reared seventeen young, one more than the Oxford birds produced. H. MAYER-GROSS and C. M. PERRINS

Dusky Warbler on Fair Isle.—The second British Dusky Warbler (*Phylloscopus fuscatus*) was trapped on Fair Isle on 14th October 1961. The first was obtained by W. Eagle Clarke at Auskerry, Orkney, on 3rd October 1913 (*Scot. Nat.,* 1913: 271-273). The only other west European record (apart from the now suppressed Sussex occurrence of 1916) was claimed by H. Gätke, who believed he saw one at Heligoland on 24th October 1876, though his description in *Heligoland as an Ornithological Observatory* (1895), pp. 284-285, is not entirely convincing. The species breeds in central Asia from about 83°E to the Pacific, and winters from north-east India to south China.

The Fair Isle bird was found by Charles Hodgkinson beside the stream in the upper part of Vaadal, at about 1000 hours GMT. He recognised it as a small, extremely dark leaf-warbler which lacked any green or yellow, and recorded that it uttered a curious hard *chak.* It was a skulker, and he soon lost it downstream in the irregularities of the valley. Whilst trying to relocate it, he was joined by Rex Clive; together they searched the area for over an hour, until Clive spotted it inside the Vaadal trap and drove it into the box.

The warbler was seen in the laboratory by G. K. Brown, M. Jones,

S. L. White and myself, and photographed by my wife. The following details were recorded:

Entire *upper-parts* from forehead to upper tail-coverts dark earth-brown, perhaps slightly paler on rump. Wings dark drab-brown with paler buff-brown edgings on flight-feathers and similar but slightly darker edgings on greater coverts; tail uniform dark drab-brown; remiges in good condition, but tail slightly abraded. Narrow but distinct buff-white supercilium extending well back above ear-coverts and slightly down-curved behind, palest immediately above eye and matched by a narrow pale mark below eye; lores and line behind eye as crown; cheeks and ear-coverts fairly warm buff, tipped grey-brown. *Under-parts:* chin buff-white, throat and upper breast deeper buff with greyish wash on tips; lower breast clear buff, almost yellowish; centre of belly off-white; sides of breast and flanks washed grey-brown with warm buff tinge superimposed; under tail-coverts and sides of ventral area clear buff; axillaries and under wing-coverts clear buff. *Soft parts:* upper mandible dark horn, lower similar for distal half and pale yellowish-flesh at base; gape yellow; legs and feet medium reddish-brown at front, yellowish-brown behind and on soles, generally slightly darker than those of most typical Willow Warblers (*Ph. trochilus*); eye dark brown. Bill slender, narrow at base; three rictal bristles, rather short; numerous short nasal hairs. *Measurements:* wing 54 mm., bill 13 mm., tarsus 21 mm., tail 45 mm. (outermost feathers *c.* 5 mm. shorter than penultimate ones); weight 8.1 gm. at 1145 GMT. *Wing-formula:* 1st primary 10 mm. longer than longest primary covert; 4th and 5th longest, 2nd −7 mm., 3rd −1.5 mm., 6th −1 mm., 7th −3 mm., 8th −4.5 mm., 9th −6 mm.; 3rd to 6th emarginated.

The yellowish tinge of the lower breast and the condition of the flight-feathers suggest that the bird was in its first winter.

After release at North Haven, it flew up to the rocky outcrop above the observatory and then on to the open moorland. Here it was watched from close range as it fed from the short turf of sheep tracks among the ling. In general shape and carriage it was very like a small Chiffchaff (*Ph. collybita*), though quite unlike our commoner leaf-warblers in coloration, appearing dark brown above and pale greyish-buff below. There was nothing in the colour to remind one of an autumn Reed Warbler (*Acrocephalus scirpaceus*), though this was the comparison made by Gätke and repeated in *The Handbook*. Autumn Reed Warblers are much redder, both above and below, than the bird we were watching. The long, narrow, buff-white supercilium was fairly conspicuous at close range, but not particularly noticeable at twenty yards or so; Gätke's bird seems to have had "very prominent" eyebrows of a rustier colour. Our bird flicked its wings and tail repeatedly, but this may have been because it had been handled, for Hodgkinson stated that it had not done so when first observed. It moved very restlessly along the sheep and rabbit tracks; here it fed exclusively from the ground, though on the steeper slope it had made one or two aerial sallies after flying insects. It was still ground-

feeding when we left it after about fifteen minutes. It was not seen again.

This warbler had to be distinguished from Radde's Bush Warbler (*Ph. schwarzi*), and it was fortunate that we had C. B. Ticehurst's *A Systematic Review of the Genus Phylloscopus* (1938) at the observatory, as well as a typescript of K. Williamson's forthcoming *Identification for Ringers: 2*. Radde's Bush Warbler has a more or less olive tinge on the upper-parts, often some yellow on the belly, a broad and conspicuous supercilium, a stouter and broader bill, and averages somewhat larger and heavier than the Dusky Warbler. The wing and tail measurements of the Fair Isle bird were near the lower limits given for the Dusky, and therefore outside or at the lowest figures for the Radde's. The weight was well within the range shown by Ticehurst for passage Dusky Warblers, but half a gramme below the minimum for Radde's. Ticehurst states that the Dusky has three rather short rictal bristles, whereas Radde's has five or six long ones. The wing-formulae of the two species are very similar.

This Dusky Warbler was present at Fair Isle at the same time as two other Siberian birds, a Lanceolated Warbler (*Locustella lanceolata*) and what was considered a Siberian Stonechat (*Saxicola torquata maura*), and within four days of two others, a Dusky Thrush (*Turdus eunomus*) and a Richard's Pipit (*Anthus novaeseelandiae*). Some of these will be described in separate notes. Charles Hodgkinson drew my attention to the curious coincidence that the previous records of Dusky Warbler and Siberian Stonechat in Britain also came within one week, the Dusky Warbler on 3rd October 1913 at Auskerry and the Stonechat on 10th October 1913 on the Isle of May (*Scot. Nat.*, 1913: 273-274).

PETER DAVIS

Nest sanitation by unfledged Pied Flycatchers.—On 23rd June 1958, at Hawick, Roxburghshire, I was watching a pair of Pied Flycatchers (*Muscicapa hypoleuca*) feeding their brood in a nest-box. The young, which were about ten days old, were coming to the entrance for the food in the normal way. I was struck by the fact that each of the parents would afterwards sit quite still outside the box for five seconds or more, just looking into the hole. They seldom actually went inside, yet on every third or fourth visit the parent concerned would take away a large white dropping about the size of a threepenny bit and I could not make out how they were obtaining these without going in. Eventually, however, I saw a young bird come to the entrance with a dropping in its bill and pass it to the adult. I could hardly believe what I had seen, but subsequently I was able to confirm it quite clearly several times. The male removed the droppings less

frequently than the female did, though he waited at the entrance hole just as much.

On 2nd July, after the young had flown, I took the box down to examine it. The distance from the bottom of the hole to the floor was four and a half inches. The nest was in one corner, the material being three inches deep on three sides and two on the fourth. Incidentally, buried in it I found three small corpses, pressed down quite flat, and a single broken egg. These young, which had been about one week old when they died, had presumably been squashed and suffocated by the two or three stronger nestlings which fledged.

W. S. MEDLICOTT

[At first sight this record seems quite incredible, but at least two similar reports concerning Wrens (*Troglodytes troglodytes*) are to be found in the literature. These observations, which were described by the Rev. E. A. Armstrong and Dr. W. H. Thorpe in a paper on " 'Casting' by Shetland Wren nestlings" (*Brit. Birds,* 45: 98-101) and also mentioned by the former in his book *The Wren* (1955, p. 204), were made by Mrs. G. A. Morris and Mrs. T. Silva in Hertfordshire and Kent respectively. Each reported that they and friends had clearly and repeatedly seen a brood of young Wrens pass faecal sacs to their parents with their bills. We showed Mr. Medlicott's note to the Rev. E. A. Armstrong who commented as follows: "This observation is strong confirmation of the accuracy of those on Wrens. It now seems proved that, in some circumstances, nestlings of species breeding in covered or cavity nests will pass faecal sacs to their parents after picking them up in their bills. It seems relevant to add that young Crowned Hornbills (*Tockus alboterminatus*) will pick up dung and drop it from the aperture of the nest (R. E. and W. M. Moreau, *Ibis,* 1940: 639-656); also that the adult Chough (*Pyrrhocorax pyrrhocorax*) will sometimes lay a chick's faecal sac on the edge of the nest and carry it off later after brooding (A. Schifferli and E. M. Lang, 1940, *J. Orn.,* 88: 550-575). Such alternative forms of behaviour suggest that it is not quite out of the question that cuckoos may occasionally place their eggs in other birds' nests with their bills."—EDS.]

Siskins breeding in Devon.—According to both *The Handbook* and D. A. Bannerman's *The Birds of the British Isles* (vol. I, p. 108), the Siskin (*Carduelis spinus*) has exceptionally been recorded breeding in some southern counties of England. Such birds are usually regarded as probably of captive origin, however, and so the following records of obviously wild Siskins breeding in Devon seem of particular interest.

During each of the last five breeding seasons, 1957-1961, small

numbers of Siskins have frequented areas of Forestry Commission coniferous woodland, between 1,000 ft. and 1,400 ft. above sea level, on central Dartmoor. The first birds were noticed in the East Dart valley at Bellever on 15th April 1957 and two pairs were subsequently identified there. In May and June the males indulged in frequent song flights over an extensive plantation of well-grown Sitka spruce (*Picea sitchensis*) admixed with smaller stands of other conifers. Breeding was established on 18th June, when P. F. Goodfellow located a pair feeding five fledglings. This family was seen by myself later the same day and on several occasions up to mid-July. There was no indication, however, that the second pair had succeeded in rearing a brood.

In late April 1958 Siskins reappeared at Bellever after being absent during the previous autumn and winter. In May and June at least two, and possibly four, pairs were present. They were very restless and ranged freely for food over a wide area between Bellever and the village of Postbridge, a mile further up the East Dart valley. In addition to feeding in the tops of plantation conifers they foraged in pastures and hedgerows, on rough hillsides among gorse (*Ulex europaeus*) and hawthorns (*Crataegus monogyna*), as well as in beeches (*Fagus sylvatica*) and willows (*Salix* spp.) and in gardens at Postbridge. Successful breeding was again established when, on 25th June, I found a female Siskin feeding two fledglings which appeared to have been out of the nest nearly a week.

In 1959, when I was unable to visit the area, three pairs of Siskins were reported at Bellever by a number of observers, but no young were seen (*Report of the Devon Bird-Watching and Preservation Society for 1959*). In 1960 I first saw Siskins again at Bellever on 18th April. About two pairs frequented the area, but breeding was not determined. During 1961 two males were repeatedly observed and one of these was definitely mated. No fledglings were seen clearly, but on 5th July I heard and glimpsed several Siskins which, from their calls, I considered to be juveniles.

I have additional records of Siskins in the breeding season at four other localities, all between one and four miles from Bellever: (i) Fernworthy Plantation, several on 18th May 1957, one on 19th July 1958 (R. M. Curber), one on 22nd June 1960 and one on 24th June 1961; (ii) Soussons Down Plantation, one on 16th June 1957, a male singing on 10th July 1958 and two males singing and chasing two days later (this is a young conifer plantation about a mile from the breeding area, which it is believed the Bellever birds visited occasionally); (iii) Two Bridges, one on 17th April 1957; and (iv) Princetown, one on 28th May 1960 in mixed woodland.

These observations suggest that, since 1957, wild Siskins have begun

to colonise certain coniferous woodlands on central Dartmoor. In at least one locality the species is now a regular summer resident. It is interesting to add that there has been a parallel colonisation of these same woodlands by Redpolls (*Carduelis flammea*). The Siskin is known to have bred only once before in Devon, on the island of Lundy in 1952 (P. Davis, 1954, *A List of the Birds of Lundy*). P. J. DARE

Reviews

Deaths of birds and mammals from toxic chemicals, January-June 1961. The second report of the Joint Committee of the British Trust for Ornithology and the Royal Society for the Protection of Birds on Toxic Chemicals, in collaboration with the Game Research Association. Published, 1962, by the R.S.P.B., The Lodge, Sandy, Bedfordshire. 24 pages.

Murder will out. For several years many people, some of them officials who ought to have known better, have denied that the increasing use of a growing variety of chemicals in agriculture is the cause of need for concern about its effect on wild life. This report should remove any traces of complacency that may still linger in their minds. With a dispassionate matter-of-factness that is more telling than any emotional outburst, it leaves no shadow of doubt that in the spring of 1961 many thousands of birds were killed by these substances.

Details of 324 incidents are given (four times as many as in the spring of 1960), in which the deaths of fifty species of birds and twelve of mammals were recorded. Of these incidents, 292 were caused by dressed seeds. The Woodpigeon was the species most commonly found dead (in 193 of the 292 incidents) followed by the Pheasant (80), House Sparrow (64) and Greenfinch (48). A map and table show that most deaths occurred in the mainly arable counties, my own county of Lincolnshire easily holding the unenviable position at the top of the league table. The species involved, the scale of two of the major incidents, the duration of incidents (deaths often occur over many weeks), the importance of sprays and dressings other than those used for seeds, the effect on fertility of sub-lethal doses and the effects already visible on the status of such birds as the Sparrowhawk and Kestrel are discussed, and the details set out in clear tables.

In a most important section the results of chemical analyses of 79 corpses are described. All but three of these (a Hare, a Snipe and a Wigeon) showed varying amounts of mercury and organo-chlorine. The flesh of four of the corpses was analysed and found to contain mercury. Included in the 79 were one Sparrowhawk, two Kestrels and four owls, the first direct evidence of the secondary poisoning that had previously been suspected but not proved.

In a soberly worded conclusion the authors welcome the recommendation of the Sanders Committee (*Report of the Research Study Group on Toxic Chemicals in Agriculture and Food Storage,* H.M.S.O., 1961, 4s. 6d.) that research, both fundamental and applied, should be extended. For, though the case is proved, there are still many queries. Will the "voluntary ban" on the spring use of dieldrin, aldrin and heptachlor be effective? How harmful is B.H.C.? Are wet seed-dressings more dangerous than dry ones? What will be the long-term effect on the vegetation of the continuous use of weed-killers (themselves not usually harmful to birds) and the effect, in turn, of that on insect populations? These chemicals have become an accepted part of modern agricultural practice and their use or disuse touches the farmer in the most sensitive part of his anatomy, his pocket. If he is to make wise use of the scientists' cleverness, he needs to be told authoritatively much more about the ultimate effects of these new and powerful aids to husbandry.

The amateur naturalist has already made an invaluable contribution in convincing the powers-that-be that this is a matter of great gravity; but there is still much to be done and his unremitting vigilance is needed.

R. K. CORNWALLIS

Studies on the Behaviour of the Black-tailed Godwit [Limosa limosa (L.)]. By Hans Lind. Meddelelse fra Naturfredningsrådets Reservatudvalg No. 66. Munksgaard, Copenhagen, 1961. 157 pages; 51 text-figures. 24.00 D.Kr. (about 24s.).

The waders form one of the largest sub-orders of birds, and yet their breeding biology has been very little studied; even when their nesting grounds are accessible, the concentration of birds is often too small for detailed work. Dr. Lind's study of the Black-tailed Godwit, based on four years' systematic observation at the Tipperne sanctuary in west Jutland, is therefore a welcome and important contribution to our knowledge.

This publication opens with detailed descriptions of the breeding godwit's inter- and intraspecific hostile behaviour, of courtship and other inter-pair displays, and of nest-building and egg-laying. Territoriality is next discussed; the birds tend to nest close together in "sub-colonies", often including Lapwings, Redshanks and other birds, and the members of these groups seem to provide a communal defence against predators. But Dr. Lind's most detailed work deals with incubation behaviour. He shows how this varies with the time after laying, the number of eggs in the nest, and the weather. I was particularly interested in his work on the little-studied subject of the behaviour of the hatching chick; he shows that the last chick hatches more quickly than the first, and points out that simultaneous hatching

of the young in a clutch cannot always be used to show that brooding began with the laying of the last egg.

However, I find his conclusions on the motivation of godwit behaviour too sweeping and so less convincing. For instance, his diagrams of the inter-relationships between the predator-situation calls (fig. 2) and of the hostile ground displays (fig. 5) seem to me too detailed, considering the amount of observation on which they are based, and I can see no justification at all for his fig. 7, purporting to show how the various displays are dependent on locomotory tendencies. Further, some of the criteria used in the analysis seem to be ambiguous; for example, the distance between the opponents in a fight (table 4) could be a measure, not only of the absolute intensity of the underlying tendencies, but of the degree of conflict between them—Dr. Lind does not appear to distinguish between the two. Again, in the ceremonial flight a sequence of movements found in other contexts seems to have been ritualised; in his analysis, Dr. Lind takes no account of the possibility that the underlying motivation may also have changed in the course of ritualisation. I could wish, too, for a more detailed discussion of the positions of the bill and back feathers in the hostile displays; why should the bill be lowered and the feathers ruffled with postulated increased dominance of attack in the Upright posture, but the opposite be true of Forward, Crouching and Tail-up? But, if I disagree with many of Dr. Lind's conclusions, I feel that his attempt at an analysis of the motivation of godwit behaviour will form a starting point for further work on the waders. Anyone interested in the group should not overlook this publication.

R. G. B. Brown

Letters

Ringed birds in snow

Sirs,—During the snowy period of early January 1962, in my garden sanctuary near Welwyn, Hertfordshire, I saw two ringed birds, a Blue Tit (*Parus caeruleus*) and a Long-tailed Tit (*Aegithalos caudatus*), with their rings thickly coated with frozen snow. They came to the feeding trays in this condition on a number of occasions. The additional weight of this cold "bracelet" must surely be detrimental to a small bird struggling to maintain life in difficult circumstances. The knowledge gained by ringing is great, but my observation raises the question whether it is advisable to ring such small birds. Some thought might be given to the possibility of designing a ring on which frozen snow is less likely to collect. Eileen A. Soper

[We showed this letter to Mr. Robert Spencer, Ringing Officer of the British Trust for Ornithology; his comments appear overleaf.—Eds.]

Sirs,—From time to time the Bird Ringing Committee has received reports of snow accumulating on rings, but they have been so infrequent as to suggest that it is quite exceptional. However, following the severe weather in early January 1962, four people, including Miss Soper, reported this phenomenon and I therefore spent a day watching in my garden, where the majority of the birds are ringed. The snow was about 1½ inches deep; the temperature about 28° F in the morning, rising to 32° F in the middle of the afternoon.

I found that many birds acquired temporary snow accumulations on their rings, although it happened most frequently with Song Thrushes (*Turdus philomelos*) and Blackbirds (*Turdus merula*) which spent much of the time foraging through the snow. Snow-balls also gathered on the legs and plumage of several unringed birds. Some snow-coated rings achieved diameters about that of a cigarette, but the majority were smaller. On the few birds I was able to catch and examine, the snow was confined to the outside of the ring and crumbled away on being touched. On both the day of observation and on subsequent days I could find no evidence of leg damage on the small number of retraps I was able to handle.

Robins (*Erithacus rubecula*), Dunnocks (*Prunella modularis*), Blue Tits (*Parus caeruleus*), Song Thrushes and Blackbirds were all seen to remove snow from their rings by pecking. A female Blackbird which was carrying a large accumulation of snow on the ring, and a small one on the unringed leg, was seen to fly to an adjacent fence where it perched for some five minutes with its feathers fluffed out so that the legs and feet were invisible. When it left the snow had melted away, but this thawing process may have been unintentional.

It thus seems likely that although snow may accumulate on rings, and indeed on the bodies of birds, it is easily and frequently removed. If it were a definite hazard, the problem would have come to light long ago in the many countries which experience winters more severe than ours.

ROBERT SPENCER

Snow Bunting recovered in Newfoundland

Sirs,—I was very interested in the recovery in Newfoundland of a Snow Bunting (*Plectrophenax nivalis*) ringed on Fair Isle, in the "Report on bird-ringing for 1960" (*Brit. Birds,* 54: 493), but I did not feel satisfied by the interpretation that this bird had probably wintered on different sides of the Atlantic in successive years. I therefore examined the charts of the *Daily Weather Report* for the period immediately preceding the occurrence in Newfoundland on 1st May 1960. These showed that on the previous day, 30th April, when there was a low pressure centre some 500 miles SSE of Cape Farewell, a north-easterly airstream extended from Iceland right over southern Greenland to

Newfoundland, reaching 30 knots at sea-level between Greenland and Newfoundland. In addition, fronts near Iceland and southern Greenland were giving overcast conditions and rain in both these areas. In other words, the conditions were exceptionally suitable for prolonged drift of a bird migrating from Europe to Greenland, which might easily have brought it to Newfoundland by 1st May.

It may be noted also that the original occurrence of this bird on Fair Isle on 7th April 1959 corresponded with a period of fresh (15-30 knot) north to north-west winds from the area of Iceland, with a depression off Shetland. The five recoveries in northern Russia of Snow Buntings ringed in north-east Greenland (*Dansk Orn. Foren. Tidsskr.*, 55: 207) suggest that this species regularly migrates from Greenland over northern Scandinavia; so this is perhaps more likely to have been a Russian wintering bird drifted south to Fair Isle on spring migration than one of the comparatively few wintering on the North Sea coasts. South-westward drift at a later stage of the migration in the following spring would then account satisfactorily for the occurrence in Newfoundland.

S. L. B. Lee

Destruction of House Martins' nests

Sirs,—Apropos of the interesting note on House Martins (*Delichon urbica*) building a nest of cement (*Brit. Birds*, 55: 134-135), I wonder if you would consider drawing the attention of your readers to Section 1(b) of the Protection of Birds Act, 1954, where it is stated: "If any person . . . takes, damages or destroys the nest of any wild bird while that nest is in use . . . he shall be guilty of an offence against the Act." One can understand some people objecting to the droppings below the nests of House Martins, but the inconvenience can be obviated by placing a board underneath. This has the further advantage of giving a chance to the nestlings if the nest falls down for any reason.

Douglas Carr

A possible explanation of "reverse migration"

Sirs,—I was interested in Dr. I. C. T. Nisbet's recent paper on "South-eastern Rarities at Fair Isle" (*Brit. Birds*, 55: 74-86) and should like to suggest an improbable, but possible, explanation of "reverse migration". This I think could be the result of a mere error in the direction-finding mechanism in the individual bird. If it is accepted as a valid hypothesis that birds on long distance migration (as opposed to homing) instinctively develop a sense of the appropriate direction by reception of the light of sun, moon or stars from a certain angle, a purely mathematical error could surely occur in the brain mechanism responsible for receiving this information and translating it into nervous action. This might result in the adoption of the reciprocal

instead of the "intended" bearing, a mistake familiar to all of us who use maps and compasses, though in this case the "error" should not be regarded as anything other than instinctive.

The fact that "reverse migration" vagrants are usually juveniles suggests that the immaturity of the direction-finding mechanism may be responsible for an error of this nature. Furthermore, the aberration of only a very small proportion of the migrating population makes me wonder whether it may result from some individual factor rather than from the effect of such a major diversionary influence as wind or temperature. I do not pretend to explain the coincidence of high temperatures in the area of origin, which Dr. Nisbet's data show.

M. J. ROGERS

Requests for information

Wreck of Fulmars in February and March 1962.—Unusual numbers of Fulmars (*Fulmarus glacialis*) were noted close inshore on various parts of the east coast during February. In some areas a high proportion were of dark or intermediate phases. During the next few weeks many dead Fulmars were washed up on beaches from at least Aberdeen to Kent and odd ones were reported inland. Fulmars are generally regarded as particularly hardy birds and a wreck of this kind seems almost unprecedented. An analysis is therefore being prepared and we ask that all records be sent either to B. S. Pashby, 3 Ann's Place, Napier Terrace, Norfolk Street, Hull, Yorkshire, or to John Cudworth, 17a Prospect Road, Ossett, Yorkshire. Data required include numbers of Fulmars seen offshore (with, if possible, proportions of dark and light individuals), whether or not such birds were feeding, and numbers and colour phases of ones found dead (with any information on other species seen dead at the same period). Even though it is now three months after the event, it is still worth looking out for remains of Fulmars on beaches.

Wreck of Shags in March 1962.—Exceptional numbers of Shags (*Phalacrocorax aristotelis*) appeared in southern England from the end of the first week of March and many were recorded inland. The wreck seems to have been on a much larger scale than the one in February and March 1958 (*Brit. Birds*, 51: 131), though the general pattern was similar in that mostly first-year birds were involved and the area concerned was the south-east coast and a broad fan of inland counties between west and SSW of the Wash; ringing recoveries so far suggest that most, if not all, again came from colonies in north-east England and south-east Scotland. Robert Spencer and I. J. Ferguson-Lees are preparing an analysis of this wreck and would be glad of any inland records which have not already been sent to them, as well as details of unusual concentrations on the coast. Notes on local weather conditions (especially visibility) at time of arrival and observations on roosting, feeding and other behaviour would also be welcome. All information should be sent to I. J. Ferguson-Lees, 30 St. Leonard's Avenue, Bedford.

We regret the absence of the "Recent reports and news" from this and the previous three issues. It is hoped to resume this as a regular feature very shortly.

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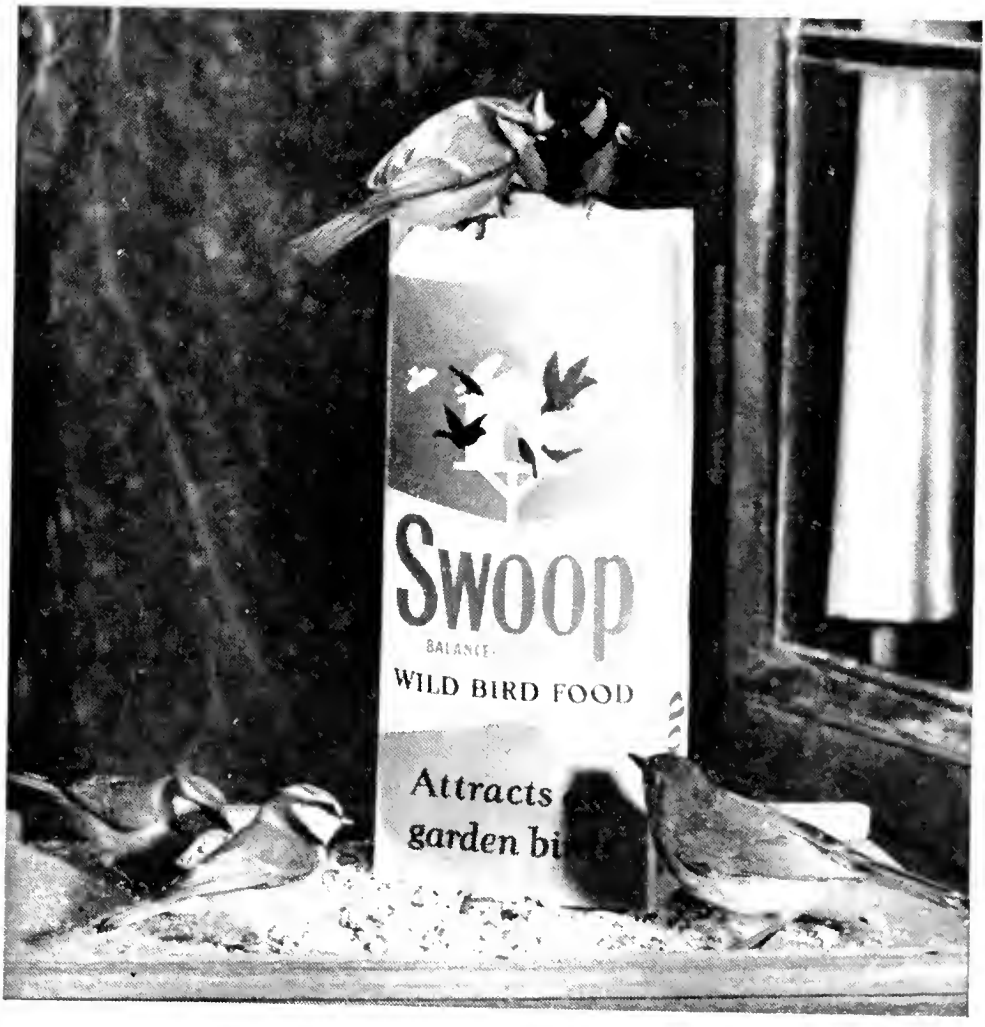

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Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and layout are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing systematic lists, reference lists, tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in January 1953 (46: 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Subspecific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1962" and no other, except in tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1", whichever most suits the layout of the table concerned. It is particularly requested that authors should pay attention to reference lists, which otherwise cause much unnecessary work. These should take the following form:

TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, 42: 129-134.

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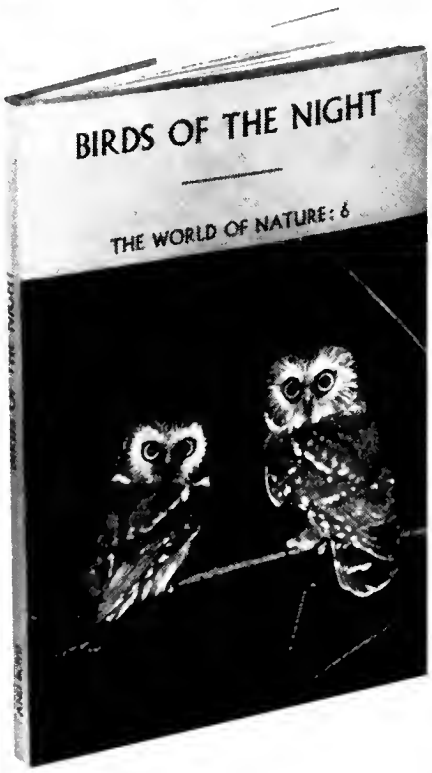

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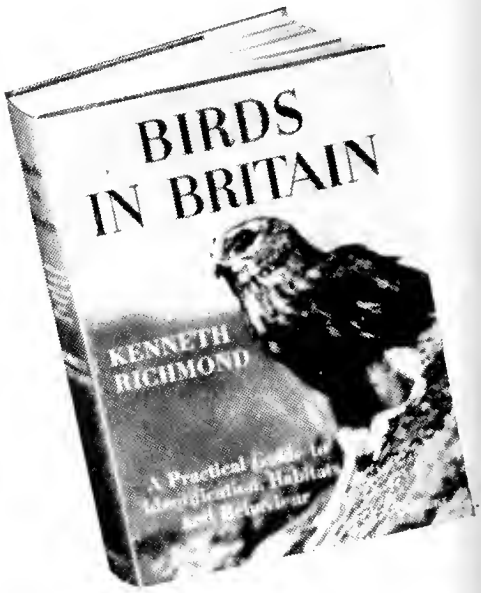

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British Birds

Vol. 55 No. 6

JUNE 1962

Albinism and melanism in birds

By Bryan L. Sage

(Plates 41-47)

INTRODUCTION

THE STUDY OF heterochrosis or colour variations in the plumage of birds is a subject that the majority of field ornithologists either ignore entirely or regard with only mild curiosity. In the early years of the present century and before that, however, interest was more widespread and a number of very fine skin collections of abnormally coloured birds were built up. Among the most notable were those of C. J. Carroll in Ireland and Joseph Whitaker in Nottinghamshire, and the very large collection of international scope formed by Lord Walter Rothschild at Tring Museum. One of the more recent workers in this country with a deep interest in the subject was the late W. E. Glegg who published a detailed study (Glegg 1931) relating to Essex specimens. Since then there have been few British publications apart from a scattering of isolated records, though a forthcoming paper by Harrison and Harrison (in press) will deal with the possible evolutionary implications of albinism and melanism in birds. On the other hand, a good deal has been published in America, including such valuable papers as those of Lee and Keeler (1951) and Nero (1954).

Colour variations in birds fall into four main groups—albinism, xanthism, erythrism and melanism. The present paper deals only with the first and last of these, though examples of xanthism in Wood Warblers are shown on plates 44 and 45. As a result of appeals for information on albinism and melanism published in *British Birds, Bird Study* and various local journals several years ago, and broadcast by James Fisher and Dr. Bruce Campbell, I have received communications from over one thousand correspondents in the British Isles, Canada, the United States, South Africa, British Somaliland and Australia (so

that interest in the subject is by no means lacking). Several thousand records of albinism and melanism in a wide variety of species have been card-indexed, and it is proposed eventually to analyse them in a manner that will show which families, genera and species are most liable to these conditions. Meanwhile, the present paper is confined to a discussion of causes and effects.

From the aesthetic point of view the beauty of many of these aberrant birds is quite remarkable, but there are also a number of practical ways in which the field ornithologist may be affected. An obvious one is the matter of mis-identification. There are many instances of inexperienced observers reporting partially white Chaffinches* and House Sparrows as Snow Buntings, or male Blackbirds with white on the breast as Ring Ouzels. Less common have been cases of albinistic Black-headed and Common Gulls being identified as Ivory Gulls.

The persistence with which individual birds return year after year to the same area can be easily observed if abnormally marked individuals are involved. Two such cases have concerned Oystercatchers. A pure white one was seen in Morayshire, Scotland, almost annually from 1937 to 1956 (*Scot. Nat.*, 61: 185-187; and 68: 115-116) and I am informed by F. R. Smith that another white individual appeared on the Exe Estuary, Devonshire, every year from 1940 to 1955. These records throw interesting light on the apparent longevity of the Oystercatcher. Another way in which such aberrant birds are useful is in tracing the movements of flocks. At one time or another it has been possible to do this with geese, waders and various Passerines.

Finally, one may mention the subject of behaviour, a field that has hardly been touched so far as abnormally coloured individuals are concerned. In numerous species the sexual functions of display and ceremonial behaviour, and threat displays, are focused so largely round colour patterns that the study of albinos might be very rewarding.

It is clear from correspondence and conversations with numerous ornithologists and naturalists that a considerable amount of misunderstanding exists regarding the causes of abnormal colorations. The most frequent misconception is that these conditions are purely due to mutation and always hereditary, but this is not so. The study of albinism and melanism leads one into many fields of science from endocrinology and genetics to physiology and biochemistry. The purpose of this paper is to set forth in a reasonably non-technical manner the diverse factors which may give rise to these conditions, and I propose to discuss each separately.

*Scientific names of all the birds mentioned in the text will be found in Appendices A, B or C, the first two of which are lists of the species in which albinism and melanism have been recorded in the British Isles.

Before proceeding further I should point out that it is possible for albinism and melanism to occur in the same individual. This is admittedly a somewhat rare occurrence, but two examples may be quoted. The late J. Whitaker had in his collection a Curlew obtained in Caithness in 1906; this bird had the back and part of the head pure white spotted with black, and the remainder of the plumage was dark chocolate in colour. Similarly, Canon G. A. K. Hervey informs me that in Westmorland in April 1957 he saw a Blue Tit that was entirely sooty black interspersed with white. In addition, as pointed out by Harrison and Harrison (in press), white primaries occur constantly in the first definitive plumage of the chicks of the melanistic mutant of the Pheasant (i.e. var. *tenebrosus*). In later stages of development these mutants lose the white feathers entirely.

Another general aspect is the resistance of red and orange carotenoid pigments to change. I have a number of records of albinistic or melanistic Robins and Bullfinches in which these colours remained unaltered, and Dr. J. M. Winterbottom has kindly drawn my attention to a male Red-crowned Bishop in the British Museum (Natural History), which was collected in Northern Rhodesia in 1937; this bird has the usual black parts of the plumage replaced by white, but the red areas are unaffected. A Green Woodpecker seen by R. H. C. Brackenbury in Warwickshire in 1960 was pure white with the exception of the red crown. A number of white examples of the Grey Parrot have been reported from time to time, but the red tail has generally remained unaffected. However, odd individuals of such species as these are occasionally found to have the red or orange pigments missing or much reduced.

Mechanism of melanogenesis

Before proceeding further it will not be out of place to describe briefly the process by which melanin pigments are formed in the avian body.

As stated by Fox and Vevers (1960), the lack of coloured pigments in albinos is due to the absence of an enzyme known as tyrosinase. This enzyme, which is produced within the body cells by the genes responsible for normal colour, causes the formation of melanin by oxidisation of amino acids in the body cells. In other words tyrosinase is an organic catalyst produced by the living cells.

There is experimental evidence that hormones and vitamins can influence melanogenesis. In connection with the former, Woronzowa (1929) described how the grafting of pituitary gland into albino axolotls (*Amblystoma* sp.)—salamander-like reptiles found in Mexico—caused the development of melanin. An interesting correlation between dietary vitamin D and melanisation of feathers was demonstrated by Decker and McGinnis (1947). They found that males, females and

castrated cocks of various breeds of poultry deposit abnormal quantities of black pigmentation in the feathers when maintained on a diet deficient in this vitamin. Even Buff Orpington chicks, a breed which normally has no black pigment in the plumage, showed intense black pigmentation after six weeks' feeding on a diet deficient in vitamin D. The experiments carried out by Decker and McGinnis suggest that vitamin D exercises some influence over the degree of oxidisation of melanin compounds in the developing feather.

ALBINISM

Albinism in its various forms may be defined as the complete or partial absence or suppression of the normal coloured pigments. A pure albino in the strictest sense is an individual in which there are no coloured pigments in any part of the plumage or soft parts. The feet, legs and bill generally appear yellowish-white or pinkish, and the eye appears pink due to the absence of the ocular melanin pigment which permits the blood in the capillaries to be seen through the retina. In partial albinos the normal coloration is present to a varying degree and the soft parts may or may not be affected, but the irides are always normally pigmented. Partial or incomplete albinism may be symmetrical or asymmetrical, the latter being the most frequent. A particularly interesting case of symmetrical albinism in a Blackbird is shown on plate 42b.

According to Hachisuka (1928), albinism is always of a hereditary character, but this is true only of albinism in the strictest sense as defined above. In the present paper the terms "albino" and "albinism" are used in the widest sense to refer to any individuals that are completely or partially white, irrespective of the colour of the soft parts or whether the condition is genetically based; it is most important that this be borne in mind.

Individuals in which the normal pattern and colour of the plumage is discernible but very pale or washed out in appearance are said to be leucistic or dilute. An example of this is the Oystercatcher on plate 46b. This condition is a form of imperfect or partial albinism and is due to a general reduction of pigmentation over the entire plumage (see Hutt 1949). Other synonymous terms for this condition are ghosting or schizochroism. Hutt, when dealing with dilution in the fowl, considered it apart from albinism largely on the basis that dilution affects all pigments, whereas in albinism carotenoid pigments are very often unaffected. Experimental evidence (e.g. Mueller and Hutt 1941) has shown that in some species a sex-linked recessive factor is responsible for the diluted plumage effect. A very fully investigated case of plumage dilution in a Blue Jay was described by Whitaker (1960). The blue of this and many other species is due to scattering of

light through a modified layer of transparent cells in the barbs; these are gas-filled vacuoles which lie above cells containing a brown melanin pigment. Microscopical examination showed that the pigment in the cells of the pale bird was greatly reduced as compared with a normal bird.

Feathers in which the natural oils are absent or reduced are prone to bleaching as there is a loss of protection against chemical or light action; some instances of dilute plumage may be attributable to this cause.

Hereditary albinism

Hereditary albinism in birds is generally of a recessive character. That is to say that in individuals possessing genes for normal colour and also for albinism, the former may be expected to be dominant over the latter. The experimental evidence for such a statement has been carried out primarily on Pheasants, but it is supported by field observations on various other species, notably the Blackbird. The nature of simple Mendelian recessiveness is best demonstrated diagramatically (see Fig. 1 on page 206).

As a matter of interest I have compiled Table 1 from data on Pheasants presented by Bruckner (1941), and this should be examined in conjunction with Fig. 1. Bruckner's results agree closely with those obtained by Morgan (1958) in a similar series of breeding experiments, also with Pheasants. Both these workers proved conclusively that the albinistic plumage was due to a single, autosomal (i.e. not sex-linked), recessive gene. It will be noticed that in the backcross matings in Table 1 there is a deficiency of white birds compared with the expected ratio. Statistical checking showed that this was not significant, and it was believed to be due to a higher embryonic mortality rate in the white birds.

TABLE 1—BREEDING EXPERIMENTS WITH ALBINO PHEASANTS (*Phasianus colchicus*) (FROM BRUCKNER 1941)

Generation	Parents	Actual progeny		Expected ratio	
		White	Normal	White	Normal
F_1	One normal, one white	0	103	0	103
F_2	Both F_1 normal	48	149	49.25	147.75
Backcross F_3	One F_1 normal, one white	117	145	131	131
	Both white segregates from backcross mating	75	0	75	0

The data given in Table 1 are, of course, applicable only to controlled experimental conditions. In wild populations the spread of albinism is controlled by various external factors. These include an inevitably higher mortality rate from predators, possible difficulty in obtaining a

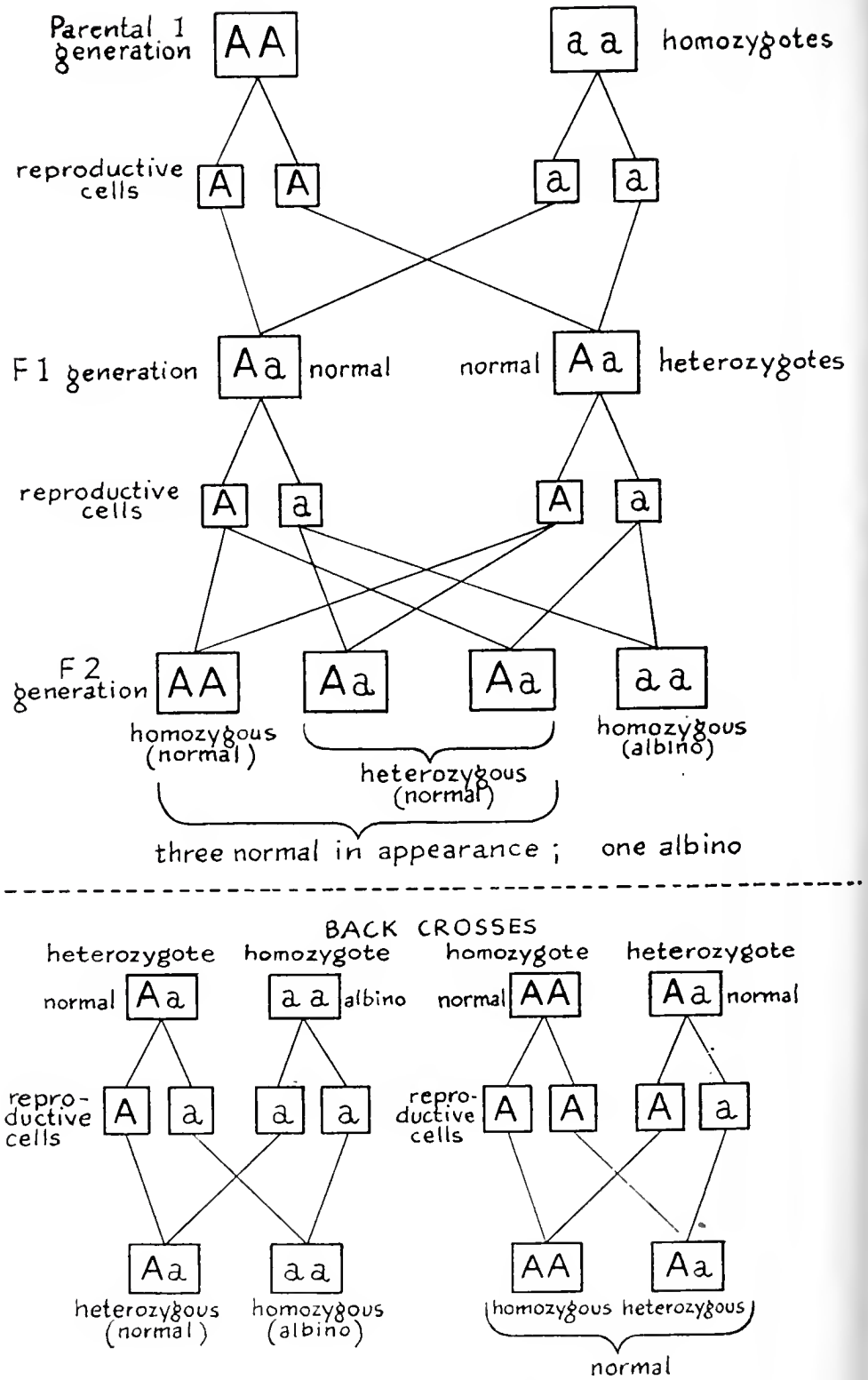

FIG. 1. Diagram to demonstrate simple Mendelian recessiveness (see explanation opposite)

mate when colour patterns essential to sexual display are absent, and post-breeding dispersal over wide areas reducing the probability of suitable matings. Other reasons are discussed in the section on the EFFECTS OF ALBINISM AND MELANISM (pages 217-220).

EXPLANATION OF FIG. 1

This explanation is intended primarily for those who profess no knowledge of genetics. When following the figure it is helpful to bear in mind the fundamental principles that each parent provides the new body cells with an equal number of chromosomes (the structures on which the genes are located) and that the number of chromosomes in any species remains constant (through a process of reduction which need not be discussed here).

In the diagram, for the sake of simplicity, it is assumed that plumage colour is controlled by a pair of genes which are situated at the same locus on the chromosomes: that responsible for the normal is designated A and that for albinism a. It is also assumed that the gene for albinism is recessive in the presence of that for normal colour. Where the genes in a pair are similar (i.e. AA or aa) the individual is a homozygote; where they are dissimilar (i.e. Aa) it is a heterozygote.

The parental generation consists of a normal homozygote and an albino homozygote. It follows that two types of reproductive cells will be produced by these parents (i.e. A and a) and the first filial generation (F_1) must all be heterozygotes of the same kind (i.e. Aa). As the albinism is recessive they are normal in colour.

The second step shows an *inter se* mating between the heterozygotes of the F_1 generation to produce the second filial generation (F_2). The expectation now is normal homozygotes, heterozygotes and albino homozygotes in the ratio 1 : 2 : 1. As a is recessive to A, it follows that the heterozygotes will be normal in appearance, even though they differ genetically from the normal homozygotes. The albino homozygotes will be pure white like the original albino parent.

As a final stage, the lower part of the diagram illustrates two backcrosses (the crossing of the progeny with their parental stocks). On the left is the backcross of the F_1 heterozygote to the albino homozygote; the expectation here, as in any backcross to a recessive form, is of normal heterozygotes and albino homozygotes in the ratio 1:1. On the right is the backcross of the normal homozygote to the heterozygote; the expectation now is of normal homozygotes and heterozygotes in the same ratio 1:1, the recessive gene being concealed (as in the F_1 generation) because it occurs only in the heterozygous phase.

The diagram thus illustrates some of the combinations of matings that are theoretically possible in a population where an albino homozygote is present. The mathematical probability of the heterozygotes breeding together depends upon the frequency of the albino gene in the population. If the frequency of the recessive gene is $\frac{1}{p}$, then the frequency of the double recessive will be $\frac{1}{p^2}$.

With these various principles in mind, this figure should be studied in conjunction with Table 1 which shows the results of actual breeding experiments with normal and white Pheasants.

In cases of mating between albino homozygotes there arises a state of recessive dominance in which all the progeny are pure albinos. This is an extremely rare event in nature, particularly so far as birds are concerned, but a perfect example of the persistence of recessive dominance in an isolated population of animals was cited by Boyd (1946): some albino Water Snails (*Planorbis corneus*) were introduced into a Cheshire pond in 1927 and a pure albino population was still flourishing in 1934.

The breeding experiments with Pheasants described above provided evidence which suggests that partial albinism may sometimes be genetically based. Bruckner found that the dominance of the gene for normal colour was not always complete, since some heterozygous individuals had occasional white feathers in the plumage and, conversely, homozygous recessive birds sometimes had an odd coloured feather in the plumage. Rollin (1962) described the case of a feral "blue rock" pigeon which had an odd white feather on the lower neck and two smaller white feathers behind the eye throughout its life, these being moulted annually. Breeding experiments showed that the bird was heterozygous for white and that the condition was, in fact, hereditary.

Although hereditary albinism in birds is nearly always recessive, there is evidence to suggest that some cases of partial albinism may be dominant. It has been known for a very considerable time that dominant piebald types occur in mice, the Rabbit (*Oryctolagus cuniculus*) and in various breeds of the domestic fowl; and a lengthy discussion of this subject will be found in Bateson (1909). Whilst I am not aware of any conclusive data relating to wild birds, it is not impossible that the persistent occurrence of partially white birds in the population of a given area may be due to (a) incomplete dominance of the genes for normal colour, as in Bruckner's Pheasants, or (b) the existence of a dominant piebald phenotype within the population. Without controlled experiments, however, it would be virtually impossible to prove which. It is more or less self evident that in a very isolated population a recessive gene may gain a much higher frequency of expression than in a population where there is gene flow over a wide area. This theory was proposed by Edson (1928) to explain the high numbers (about 40%) of white-spotted individuals in a flock of Brewer's Blackbirds. Hanson (1949) put forward the same theory to explain the high frequency of white-spotted birds in flocks of Canada Geese migrating through Illinois. So far as the British Isles is concerned there is a considerable amount of suggestive evidence relating to the Blackbird. For instance, Mrs. W. M. Martineau wrote to me that when she came to live at Lymington, Hampshire, in 1935 there was a Blackbird with white head and neck in the area, and that throughout the following 22 years there was always at least one individual with some white on the head; and all were males. Again, B. Keeley, writing in March 1957, stated that there had been partly white Blackbirds in the vicinity of his home at Chipstead, Surrey, for the previous twenty years or so, the white being mainly on the wings and body.

An interesting example of partial albinism evolving in isolation is provided by the Ravens of the Faeroes, which were named *Corvus varius* by Brünnich in 1764. This name was given to a white-speckled

mutant which had been known there since at least the Middle Ages and which at one time formed a considerable proportion of the population. A rapid decline in the numbers of this mutant began about 1850, however, and K. Williamson informs me that it was last seen in 1902. The same mutation also occurred occasionally in Iceland, but it was always very rare there. The inheritance of this mutant was studied by Dr. Finn Salomonsen who found that the distribution of black and white was approximately the same in all individuals, and that the responsible factor was recessive. Some authorities still recognise the Faeroe Ravens as a distinct subspecies (*C. c. varius*) on the basis of pale tips to some feathers of the hind neck.

Some examples of incomplete or partial albinism produce a barred effect in the plumage and it may be that, in some instances at least, there is an analogy with the "barring" occurring in the domestic fowl. Here Hutt (1949) showed that a sex-linked gene inhibits the deposition of melanin within the individual feather, causing a white bar on a feather that would otherwise be all black. It will be noted that in this paper frequent mention is made of work done on the various breeds of domestic fowl; this is a matter of necessity as, with the exception of Pheasants, little or no work of a similar nature has been carried out on wild birds under controlled conditions. The genetical experiments with poultry have shown that at least four different types of white plumage may be recognised, each having its own special properties. In one of these types the pure white acts as a dominant, a condition not so far known to occur in wild birds. However, these white types of plumage in the fowl are not albinos in the strictest sense, as the eyes and often the soft parts also are pigmented. So far as I am aware, pure albinism (still in the strictest sense) has never been found acting as a dominant to colour in any animal species.

Under the present heading we have also to discuss the question of albinism arising as a result of inbreeding. I have come across several references to this subject. Hewitt (1862, 1863) described how he took eggs from wild Mallard and hatched them under bantams. The young were reared and were allowed to breed only among themselves, with the result that each succeeding generation became larger, with the white collar broader and less regular, and some of the primary wing-feathers turned white. I have previously described (Sage 1955) the population of aberrant Mallard on Roath Park Lake, Cardiff, Glamorganshire. These birds are largely sedentary and considerable inbreeding certainly occurs; most individuals show varying amounts of white on the wings and some also have the lower neck and breast white. In the case of a wild population we have the evidence quoted by Delacour (1956) who stated that when Dr. Alexander Wetmore visited the island of Laysan in 1923 he found a population of twenty

Laysan Duck (the local race of the Mallard, *A. p. laysanensis*) of which most showed traces of albinism in the plumage. This state of affairs had obviously been brought about by continuous inbreeding.

Turning to groups other than ducks, it is well known that the dove popularly known as the "White Java" is merely an albino form of the Collared Dove which can be produced by close inbreeding from the normal type. Similarly, there is the white variety of the Java Sparrow which the Chinese probably evolved originally by selected inbreeding of pied birds.

Albinism due to diet

It has been known for many years, particularly among aviculturists, that incorrect or unbalanced feeding can affect the plumages of birds, causing both deficiency and excess of pigment (some examples of melanism will be discussed under that subject). Data on this aspect have been acquired almost entirely by experiments with captive birds, and it is impossible to say just how far the results have any analogy in wild populations. In the wild it would be extremely difficult to prove that complete or partial loss of pigmentation was due to a defective diet.

There is no doubt, however, that many (if not all) species of birds are able to convert common alimentary carotenoids to coloured compounds of different constitution. Two Continental workers (Brockmann and Volker 1934) maintained Canaries on a carotenoid-free diet. As a result, after moulting or experimental plucking, the new feathers appeared white. Conversely, it is also an established fact that if Canaries or white varieties of domestic fowl are fed on paprika (Hungarian red pepper) or cayenne pepper in an oily medium, such as olive oil, the plumage assumes an orange or crimson colour. It is also now known that the loss of red or pink colour in captive birds of species such as the Flamingo and Scarlet Ibis is caused by a lack of certain carotenoids in the diet.

So far as I am aware, the only intensive study done in this country on the effect of diet on the plumage of wild birds is that of Rollin (1953, 1959) with Blackbirds and Song Thrushes taken from the nest and reared in temporary captivity. His experiments showed that white or greyish feathers, particularly in the tail, could be produced by varying the percentage of earthworms in the diet. He also found that an insect diet superseded by one of dog biscuits, or a diet consisting exclusively of the latter, produced white feathering. I am, however, quite unable to agree with his final conclusion that an unbalanced diet is the *main* cause of partially white plumage in wild populations of the Blackbird and other species. I know of no evidence that wild birds ever encounter conditions which compel them to exist on an un-

balanced diet for any length of time. Rollin quoted the high incidence of partly white Blackbirds in the wholly urban area of Jesmond Dene, Newcastle, compared with the complete absence of such birds in an entirely rural district of north Northumberland farmland, as evidence in support of his hypothesis. However, assuming that the partly white condition in the Jesmond Dene population, which is wholly surrounded by built-up areas, is genetically based, then we should expect it to persist. In a relatively isolated population of this nature the mating of two individuals heterozygous for albinism would be far more probable than in a rural population. The discussion under the section on *Hereditary albinism* is applicable to this case. Then, again, the Blackbird certainly feeds less on domestic scraps and artificial foods than the House Sparrow or Starling, so that if an abnormal diet were the cause of partial albinism to any great degree we should expect to find a higher incidence of this condition in these two fairly sedentary and social species. According to the records in my possession, however, this is not the case. In this connection it is worth drawing attention to the work of Piechocki (1954) who examined a total of 20,931 House Sparrows which had been killed by poisoning: there were no pure white birds, and the incidence of partial albinism was less than one per cent.

Albinism due to senility

There is a considerable amount of evidence to suggest that albinism, primarily partial, may gain expression as a result of increasing age, a condition that is perhaps comparable with the greying of the hair in human beings. C. W. Teager's Blackbird on plate 41 seems to have been such a case.

One of the earliest observers to draw attention to this subject was Johnson (1852), who kept a male Blackbird in captivity. This individual became whiter with each succeeding moult and finally died at the age of four. As this was a captive bird, however, the condition may have been caused by diet or other factors. Butler (1902) mentioned a Chaffinch which was pied when it was trapped and became much whiter at two succeeding moults. More recently, various instances have been mentioned in this journal. Rankin (1954) recorded that an adult male Blackbird ringed on 6th February 1952 had the head and neck mainly white, and that when it was retrapped in February 1953 the white extended to the breast, mantle, wing-coverts and tail; he has since informed me that the bird was caught once more in 1954 when it was even whiter. Band (1956) trapped a male Blackbird annually from 1950 to 1952 and again in 1954 and 1955; on all occasions except the last the plumage was quite normal, but in 1955, when the bird was at least five years old, there

were patches of white over most of the plumage. Finally, I am informed by J. Laurie that a female Blackbird at Leigh-on-Sea, Essex, became progressively whiter from 1954 until by April 1957 it was pure white except for one or two normal feathers.

Albinism due to shock

I have come across only two references suggesting albinism from shock and both concern Blackbirds kept in captivity. J. H. Fennell (1844) described how a male, severely frightened by a cat, moulted and became pure white. A. C. Smith (1852) recorded a similar case, in which the bird assumed a piebald plumage. These records are very old, however, and there appear to be no more recent ones. J. J. Yealland of the London Zoo informs me that he has never come across such a case in his long experience of aviculture. It seems wiser, therefore, to be cautious about shock as a possible cause of albinism until such time as we have a properly authenticated observation.

If cases do occur, they may be analogous with instances of the hair of human beings turning white within a very short space of time after a severe shock to the nervous system.

Albinism due to disease and injury

There appears to be a paucity of information on albinism and disease or injury, at least so far as wild birds are concerned, although Hutt (1949) stated that in domestic fowls the spontaneous development of white feathers after injury is not uncommon.

Gunn (1876) obtained a pure white female Blackbird near Norwich, Norfolk, and associated the colour of the plumage with the diseased state of the bird's liver, which was black in colour. A case of partial albinism in a Goldfinch was similarly attributed by Macpherson and Duckworth (1886) to the diseased liver which was found when the bird was dissected. Another instance of this kind, involving a buff-coloured Red Grouse in the possession of the Hon. C. H. Wynn, was recorded by Forrest (1907). However, I have discussed this subject with Dr. James M. Harrison who informs me that he does not know of any liver disorder which would be likely to affect the colour of the plumage in this way. Until further evidence comes to hand, therefore, these three cases must be considered not proven.

On injury there is a little more information. Writing in America, Brimley (1944) referred to a male Red-winged Blackbird which was partially albinistic, including a large white patch on one side of the breast. Under this white patch was an old wound where a shot had ploughed through and left a furrow, on each side of which the flesh was discoloured and almost gangrened in appearance. In his opinion

this was the cause of the partial albinism. He also put forward the theory that birds which are seized by a predator and manage to escape with the loss of some feathers may develop partial whiteness in the affected areas.

Then there is a case described by Phillips (1954). A Great-tailed Grackle collected in Mexico was white on one side of the face. It was subsequently ascertained that a large yellow cyst was present beneath the skin at this point, and that this had formed round a sliver of some kind which was imbedded in the jaw muscles. Similarly, Hachisuka (1928) mentioned a hen Capercaillie which was bitten by a Stoat (*Mustela erminea*); after the wound had healed, white feathers grew on the affected part.

More recently, Dr. Bruce Campbell has passed on details of an interesting observation by G. R. A. Wright. For two or three years a Blackbird, identifiable by a deformed foot, had frequented the latter's garden. In the summer of 1961 this bird was found hanging by the neck from the mesh of some fish netting protecting raspberry canes. The bird was released and was not seen again until the winter, but when it reappeared it had a ring of white feathers round the neck.

There is a considerable amount of experimental evidence relating to traumatic causes of partial albinism. Dealing with mammals, both Duerst (1926) and Schultz (1918) have discussed the experimental infliction of wounds which, on healing, have grown white hairs. Similar work has been done on various breeds of the domestic fowl; for instance, Pearl and Boring (1914) and Křiženecký (1930) have shown that albinism can occur as a result of plucking. We should also note the statement of Fox and Vevers (1960) that "As a final instance of loss of melanin it may be noted that injury can be responsible for the disappearance of melanocytes".

The occurrence of isolated white feathers can also follow damage to or blocking of the gland by which the pigment passes into the feather. A similar explanation may be applied to parti-coloured feathers. Where pigmentation proceeds normally at first and ceases later, the feather will be normally coloured from the apex to the point where pigmentation ceased, and white from then on. Alternatively the gland may be non-functional at first and start operating later, in which case the distribution of the pigmented and white areas will be reversed. A simple experimental lesion of the pulp of a growing feather will cause it to develop white.

Summary

Before going on to discuss melanism it may be useful briefly to summarise some of the points considered in the preceding pages:

(1) Pure albinism in the strictest sense is congenital and, so far as is

known, always acts as a Mendelian recessive. There is no proven evidence that such individuals ever revert to normality.

(2) It is impossible for pure albinism to be developed from a state of normality, i.e., it must show in the first definitive plumage.

(3) Some forms of partial albinism are hereditary and probably mainly recessive, but it is known that dominant piebald varieties occur in some animals including the domestic fowl and, therefore, possibly also in other species of birds. Partial albinos always have pigmented irides.

(4) Individuals of normal coloration may develop partial or complete albinism (but not pure albinism in the strictest sense) from diet, senility, injury and possibly disease and shock. As this type of albinism is not congenital, the affected individual may later revert to normality.

(5) Hereditary partial albinism may occasionally revert to normality, as for instance the white primaries which occur only in the first definitive plumage of Pheasant chicks of the mutant variety *tenebrosus*.

(6) Experimental work with Pheasants indicates that albinism is not a sex-linked condition and this is supported by observations on numerous species in the wild. However, Mueller and Hutt (1941) reported sex-linked imperfect albinism in the domestic fowl and analogous cases may occur in wild species.

MELANISM

Melanism is the exact opposite of albinism in that it is caused by the excessive deposition of melanin pigments. This results in an abnormally dark appearance and melanistic individuals are generally blackish or dark brown in colour. The condition is certainly of much less frequent occurrence than albinism, even taking into account the fact that it may often be overlooked because it is far less noticeable, particularly in species where the normal colour of the plumage is dark.

Another major difference between albinism and melanism is that the latter is generally a Mendelian dominant, that is to say that it can gain expression in the heterozygous phase in the F_1 generation. Cases of recessive melanism have been found in some organisms (e.g. moths), but they are generally rare mutants and do not spread.

The dominant nature of melanism often results in populations where the melanistic phase is very numerous and distributed over a wide area. A good example can be found in the spread of the melanistic variety of the Grey Squirrel (*Sciurus carolinensis*) in Hertfordshire, where it has been known for a great many years (see Fordham 1956, who quotes a number of references, and Shorten 1954). Before the arrival of myxomatosis I was aware of several Hertfordshire colonies

of Rabbits where blackish individuals were common. At one of these colonies approximately 46% of the population were melanics, and blackish Rabbits had been known there for at least twenty years. Melanistic Rabbits are also of common occurrence in Australia and, according to Barber (1954) this type may comprise 35% of the total population in the forested interior of Tasmania. A similar state of affairs, though on a more restricted scale, existed in the Partridge population of the Tring area of Hertfordshire. In January 1915 the late Lord Walter Rothschild exhibited to the British Ornithologists' Club two melanistic Partridges which were representative of a type that had been shot at Tring for ten successive years.

Normal and abnormal melanism

Under this heading I propose to discuss two types of melanism. The first, which can conveniently be designated normal melanism, refers to those dimorphic or polymorphic species in which a melanistic plumage phase is of regular occurrence. The second, abnormal melanism, covers individual species not normally producing a melanistic phase.

There are a considerable number of birds in the world which are known to have a normal melanistic phase. Among British species one immediately calls to mind the dark brown or blackish varieties of the Snipe, Pheasant, Red Grouse, Partridge, Buzzard and Montagu's Harrier. In several cases, such as the Snipe and Montagu's Harrier, these melanistic varieties were described as separate species before their correct identity was known. In addition to the Buzzard and Montagu's Harrier, a number of other birds of prey have a melanistic phase. Examples are Eleanora's Falcon in the Mediterranean, the Gabar Goshawk in Eastern Africa, and the Rough-legged Buzzard and Short-tailed Hawk in America. In the majority of these cases the melanistic type is of random distribution. In all the species mentioned so far, the normal plumage is fairly dark, but melanistic phases also occur in birds which are normally mainly white. In Africa, for example, the Little Egret has various colour phases ranging from the normal white through pale grey and sooty-grey to blackish-slate.

Under certain ecological conditions natural selection may favour a melanistic type. A good example is found in the blackish forms of the Desert Lark which occur on black lava terrain in various parts of the range of that species. The race of the Partridge in north-west Germany (*P. p. sphagnatorum*) is another case of a melanistic form adapted to a particular habitat, in this case black peaty soils.

An interesting example of an occasional melanistic form becoming established and replacing the normal form in comparatively recent times is that of the West Indian Bananaquit. Attention was first

drawn to this species by Lowe (1912), and now most of the birds on the islands of St. Vincent and Granada are black. Analagous instances are known among such mammals as the Hamster (*Cricetus cricetus*) and the Brush Opossum (*Trichosurus vulpecula*).

Industrial melanism among moths is now a well established fact. What may well have been the beginning of an identical situation in the House Sparrow was suggested by Hardy (1937), who stated that a slight but definite darkening of the plumage had taken place in the population of this species in the Liverpool area. In recent correspondence Mr. Hardy informs me that his studies were terminated by the outbreak of war in 1939, and that he has since been unable to follow the matter further. Confirmation of this possibility is provided by Noble Rollin who tells me that before 1930 he also found evidence of industrial melanism in House Sparrows whose plumage could not be made lighter by washing. Data on the present situation in Liverpool or other industrial areas would be of great interest.

One of the most remarkable cases of partial melanism so far recorded is that seen in the specimen of the Gabar Goshawk figured by Hachisuka (1928). This bird is quite normal on one side and entirely melanistic on the other.

In the British Isles most records of melanism in species other than those normally having a melanistic phase involve isolated instances only. During the period 1954-1959, however, melanistic Great Tits were reported from Ashtead, Esher, Hersham, Long Ditton, Oxshott, Surbiton and Woking, all in Surrey, and there can be little doubt that most of these records are related. In at least one case (that at Oxshott) the young of a melanistic parent all apparently had normal plumage, but, as recorded by Perrins (1959), eight out of nine young Great Tits in a brood at Hersham were melanistic (plate 47). There the female parent was normal, but the male was unfortunately not seen.

Some instances of melanism in gulls are worth mentioning. The most interesting concerns Black-headed Gulls. During December 1961 and January 1962 at least four individuals (two entirely blackish and two piebald) were seen in the vicinity of Seahouses, Northumberland (Evans 1962). On 3rd January one of the blackish birds was trapped and examined, and it was established that the condition was due to pigmentation and not oiling. The great interest of this record lies in its possible connection with an entirely blackish bird of this species seen at Elton, Co. Durham, by Dr. J. D. Summers-Smith in December 1956. It is difficult to resist the conclusion that there is somewhere a breeding colony where this melanistic type has been perpetuated. If such a colony could be located and the aberrant birds colour-ringed, valuable information on the inheritance of this condition might be obtained.

It is worth noting that melanism has been reported in two other gulls in the British Isles. Stokoe (1954) photographed a black Herring Gull at St. Bees Head, Cumberland, in July 1952 and a similar observation was made by Canon G. A. K. Hervey in the same area in August 1957. Meanwhile, another Herring Gull which was almost entirely dark brown was seen by Dr. Summers-Smith at Seaton Carew, Co. Durham, in December 1954. A juvenile Lesser Black-backed Gull with dark brown under-parts was identified on the Isles of Scilly in July 1925 (Robinson 1926); and another, dark brown with the exception of the head and wings, was seen at Morecambe, Lancashire, in August 1957 by Canon Hervey.

Melanism due to diet

It is an established fact that the plumage of birds can be made black or dark brown by selective feeding. The example that is generally quoted is that of the Bullfinch, which will turn quite black if fed on a diet of hempseed with a high oil content. However, other species can be equally affected. Stevenson (1866) mentioned a Goldfinch which became black as a result of being fed freely on such a diet, and Newman (1855) described a similar experience with a Hawfinch. Christy (1890) quoted a case of a Redwing which was caught in January and became pure black when it moulted in August; he did not state the cause, but it also may well have been connected with the diet in captivity. It is hardly necessary to add that when the hempseed is removed from the diet an affected bird will gradually return to its normal colour. The chemical and physiological processes involved were discussed in detail by Staples (1948).

Goodwin (1957) recorded a somewhat different example of temporary melanism in the Spotted Dove. He suggested that the condition might have been brought about by adverse factors operating during the growth and pigmentation of the first adult plumage, in particular an over-fat condition induced by insufficient exercise and a diet rather rich in fats; here food alone could not have been entirely responsible. Bannerman (1953) mentioned that one of a brood of five Goldfinches reared by Col. R. F. M. Meiklejohn in Estonia was coal black, and remained so until the first moult when it became normal. This temporary melanism presumably had no connection with food, however, as the other four birds were not affected.

EFFECTS OF ALBINISM AND MELANISM

Such information as is available on the effects of albinism and melanism consists mainly of scattered and random observations, and there appears to be a great lack of detailed work on the subject.

Two points regarding albinos which immediately come to mind

are vulnerability to predators and persecution by other birds. So far as the first is concerned, it is obvious that a white or nearly white bird will, in all but a few specialised habitats, be far more conspicuous to predators than one that is normally coloured, and there is little doubt that mortality from predation is higher. Persecution by birds of the same or other species is a variable factor. In some instances albinos are attacked, and in other cases they are accepted. There are numerous references to both types of behaviour in the literature and it does not seem necessary to quote them.

In the introduction to this paper I mentioned the subject of display. Sexual display and other forms of behaviour that involve the use of special plumage patterns and striking colours may well be affected if these are absent or reduced. Close study of abnormally coloured individuals may show that unusual behaviour patterns are acquired in the course of time.

Physiologically speaking there is little doubt that most pure albinos are pathological to a greater or lesser degree, and have a poor expectation of life. Experimental work has produced much interesting evidence of this. For example, Dunn (1923) reported a lethal gene linked with recessive white in the White Wyandotte fowl. Hunter (1939) described a light-feathered generally recessive mutation of the Mallard which was produced after 18 years in captivity; his breeding experiments with this strain showed that a semi-lethal weakness of embryo and duckling was associated with the light gene. Similarly, in his experiments with Pheasants, Bruckner (1941) found evidence which suggested that embryonic mortality was higher in the homozygous albinos.

Defective eyesight may also often be correlated with albinism. One of the best examples of this in wild birds is provided by the work of McIlhenny (1940) on the Mockingbird. A total of twelve nests were studied, all belonging to one male and his two successive mates. The male and the first female were evidently heterozygous for albinism, for 18 of the 43 young they hatched were albinos. These were deficient in sight, weak in voice and far less active on the wing; none lived long, whereas all but two of the normal young survived. Keeler, Hoffman and Shearer (1949) studied a faded feather mutation in the Turkey; such mutants were found to have defective vision, broken or missing feathers, weak bones and small bodies. Keeler also found that a pair of albino Collared Doves had defective vision. Lincoln (1958) described how an albino Purple Martin died as a result of colliding in flight with the branch of a tree; post-mortem examination showed that it was apparently suffering from starvation, and it was assumed that poor eyesight had also prevented the bird from catching an adequate supply of insects. Similar instances have been found in

mammals. For example, the manner of the death of a pure albino Otter (*Lutra lutra*) in broad daylight suggested that it had defective vision (McDonald 1959).

The case of the albino Mockingbirds that were less active on the wing has already been mentioned. Keeler noted exactly the same thing in his albino Collared Doves. Dr. Alexander Wetmore found the albinistic Laysan Duck to be so lacking in the power of flight that that they could be run down and captured by hand (see Delacour 1956). We have already seen that in pure albinos the soft parts are always depigmented, with the result that the irides usually appear pink or reddish and the legs and bill pale yellowish or whitish. However, it should be added that some pure albinos have blue eyes. It is generally supposed that this phenomenon is peculiar to the Pheasant, but I also have records of a pure white Dunnock and a pure white House Sparrow with blue eyes. The genetics of this character evidently require further study. I have already pointed out (Sage 1958) that in some birds a lack of pigment in the soft parts is not necessarily correlated with any plumage abnormality, as in the case of the Moorhen which may have yellow legs and bill and normal plumage.

Structural modifications of the feathers may sometimes be associated with albinism, and this aspect was dealt with by Chandler (1916). The best known example is the "hairy" variety of the Moorhen in which albescent plumage is accompanied by a lack of interlocking barbules on the feathers. A similar condition has been recorded in some other species, however—for example, the Jay—and Nero (1954) referred to Red-winged Blackbirds with individual white feathers of this hair-like texture. It may be pointed out that in fowls and pigeons there is a condition known as silkiness, in which the barbules fail to interlock owing to some structural deficiency (see Hutt 1949).

Mrs. J. Gladwin has given me details of a male Blackbird trapped at Rye Meads, Hertfordshire, in November 1961, which had a single white primary feather. This was coarser than the other primaries in texture and the shaft was thicker; in addition, it did not lie in line with the other feathers but was twisted. As the shaft was straight the twisting evidently originated from the sheath. A further instance of structural variation associated with partial albinism was recorded by Finnis (1959). A juvenile male Blackbird found dead in Kent in May 1959 had a considerable amount of grey in the plumage including most of the wing feathers. On examination it was found that the feathers were unusually fragile and that the tips of the rectrices exhibited an abnormal amount of abrasion.

A remarkable association of a physical defect with albinism was described to me by C. J. Beese. A pied Blackbird in his garden was apparently quite deaf as on several occasions he approached it closely

from behind without being detected, sometimes even making a considerable noise. He added that he had also known of albinistic House Sparrows and Rabbits, as well as rats and mice, which were apparently quite deaf.

So far as melanism is concerned there appears to be very little on record regarding correlated conditions. In quite a few instances melanistic mutants of the Pheasant are larger and more robust than normal individuals. Legendre (1941) wrote of the dark mutant Pheasant—"The bird is large and robust. As a game bird, the dark Pheasant presents itself as flying high and fast. Its weight is greater than that of ordinary Pheasants." This should not be taken as an invariable rule, however, as some melanistic individuals are no heavier or larger than normal birds, though a melanistic Buzzard that was taken from a nest in Caernarvonshire and hand-reared was stated to be of above average size (Niall 1960).

I have been unable to trace any records of lethal conditions associated with melanism.

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PLATE 41. Partial albino male Blackbird (*Turdus merula*, Essex, January 1969. The next autumn this bird became much whiter – its head and back pure white and its tail and wings broken white; only its under-parts stayed largely black. This and other cases of progressive albinism suggest that white plumage sometimes develops as a result of increasing age (pages 221-225, especially 211) (*photo: C. W. Trager*)

PLATE 42. Above, partial albino Red-necked Grebe (*Podiceps griseigena*), Switzerland, October 1955 (*photo: A. Schifferli*). Such albinism is often unequal in distribution (page 204), but an interesting case of almost perfect symmetry in a Blackbird (*Turdus merula*) is shown below (*photo by permission of G. W. Temperley*)

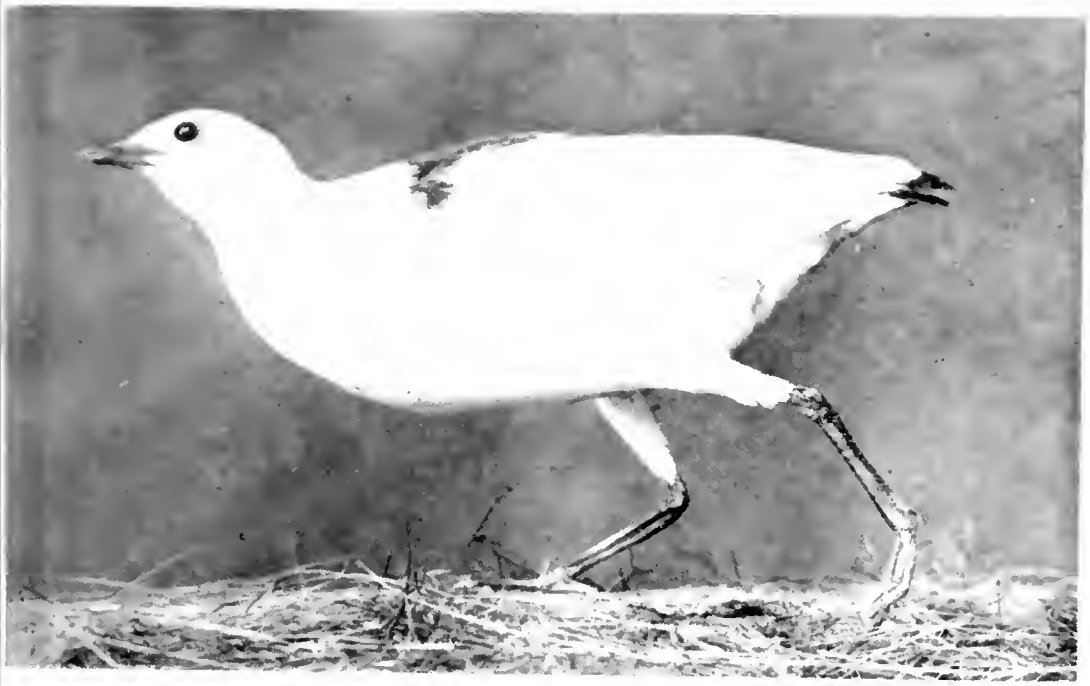

PLATE 43. Mounted specimens of nearly pure white Corncrake (*Crex crex*), Derbyshire 1892, and Curlew (*Numenius arquata*), Northumberland 1856 (*photos from Whitlock 1893 and Bolam 1912*). Albinism has been recorded in a great variety of birds: Appendix A (pages 223-224) lists 160 species of 104 genera in Britain alone

PLATES 44 and 45. Xanthistic Wood Warblers (*Phylloscopus sibilatrix*), Wales, June 1954. Xanthism is due to excess retention of yellow and loss of dark pigment. Here the male (*above*) was normal except for a straw coloured cap, but the female (*opposite*) had a primrose head and back, darker yellow shoulders and tail coverts, white under parts and white outer tail; her bill and legs were the colour of dead bracken, but note that her eyes were dark brown (page 204). (*photos: Eric Hosking*)

PLATE 46. Above, partial albino Lapwing (*Vanellus vanellus*), Yorkshire, April 1932 (*photo: Walter Higham*). Below, dilute Oystercatcher (*Haematopus ostralegus*), Cheshire, October 1954; this is an imperfect form of albinism in which there is an even reduction in pigment over the entire plumage (page 204) (*photo: Eric Hosking*)

PLATE 47. Four views of a melanistic young Great Tit (*Parus major*), Surrey, May 1957. This bird was from a brood of nine, all but one of which were similarly black and grey-black all over—even to the parts that are usually yellow and white. The mother was normal and the father not seen (page 216) (*photos: K. F. W. Doughty*)

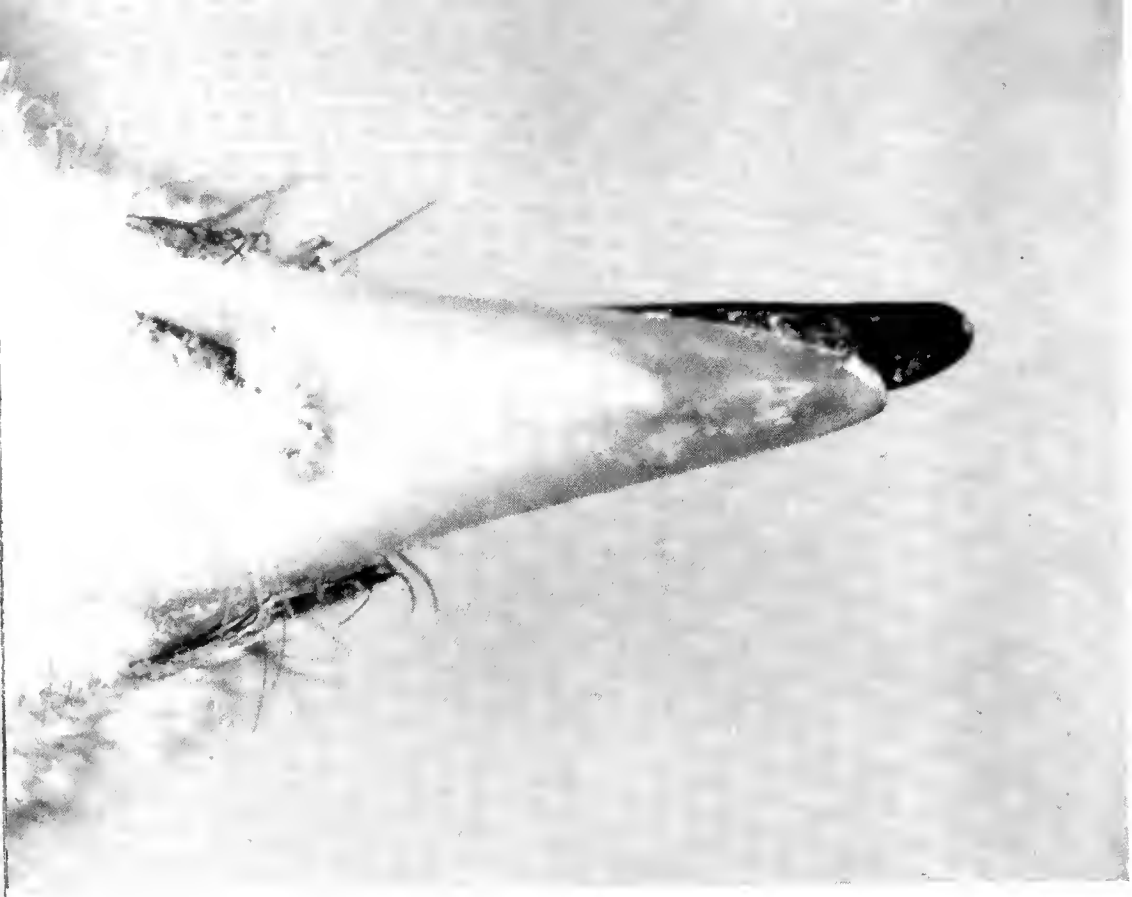

PLATE 48. Deformed bills of Short-toed Lark (*Calandrella cinerea*) (*above*) and Herring Gull (*Larus argentatus*). The lark (upper mandible elongated and twisted) was 30% underweight; the gull (upper mandible broken, lower elongated) was a good weight and healthy (pages 236-237) (*photos: George E. Watson and C. Stockton*)

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Appendix A—Species in which albinism has been recorded in the British Isles

Not included here are a number of other species on the British List, such as the Lesser Kestrel (*Falco naumanni*) and Willow Tit (*Parus montanus*), which have records only in the foreign literature

Red-throated Diver (*Gavia stellata*)
Red-necked Grebe (*Podiceps griseigena*)
Little Grebe (*Podiceps ruficollis*)
Gannet (*Sula bassana*)
Cormorant (*Phalacrocorax carbo*)
Shag (*Phalacrocorax aristotelis*)
Heron (*Ardea cinerea*)
Bittern (*Botaurus stellaris*)
Mallard (*Anas platyrhynchos*)
Teal (*Anas crecca*)
Garganey (*Anas querquedula*)
Wigeon (*Anas penelope*)
Pintail (*Anas acuta*)
Shoveler (*Spatula clypeata*)
Tufted Duck (*Aythya fuligula*)
Pochard (*Aythya ferina*)
Common Scoter (*Melanitta nigra*)
Eider (*Somateria mollissima*)
Ruddy Shelduck (*Casarca ferruginea*)
Grey Lag Goose (*Anser anser*)
White-fronted Goose (*Anser albifrons*)
Bean Goose (*Anser fabalis*)
Pink-footed Goose (*Anser brachyrhynchus*)
Brent Goose (*Branta bernicla*)
Barnacle Goose (*Branta leucopsis*)
Golden Eagle (*Aquila chrysaëtos*)
Buzzard (*Buteo buteo*)
Sparrowhawk (*Accipiter nisus*)
White-tailed Eagle (*Haliaëtus albicilla*)
Honey Buzzard (*Pernis apivorus*)
Hen Harrier (*Circus cyaneus*)
Peregrine (*Falco peregrinus*)
Merlin (*Falco columbarius*)
Kestrel (*Falco tinnunculus*)
Red Grouse (*Lagopus lagopus scoticus*)
Black Grouse (*Lyrurus tetrix*)
Capercaillie (*Tetrao urogallus*)
Red-legged Partridge (*Alectoris rufa*)
Partridge (*Perdix perdix*)
Pheasant (*Phasianus colchicus*)
Water Rail (*Rallus aquaticus*)
Corncrake (*Crex crex*)
Moorhen (*Gallinula chloropus*)
Coot (*Fulica atra*)
Oystercatcher (*Haematopus ostralegus*)
Lapwing (*Vanellus vanellus*)
Ringed Plover (*Charadrius hiaticula*)
Grey Plover (*Charadrius squatarola*)
Golden Plover (*Charadrius apricarius*)
Turnstone (*Arenaria interpres*)
Snipe (*Gallinago gallinago*)
Jack Snipe (*Lymnocryptes minimus*)
Woodcock (*Scolopax rusticola*)
Curlew (*Numenius arquata*)
Whimbrel (*Numenius phaeopus*)
Bar-tailed Godwit (*Limosa lapponica*)
Green Sandpiper (*Tringa ochropus*)
Common Sandpiper (*Tringa hypoleucos*)
Redshank (*Tringa totanus*)
Greenshank (*Tringa nebularia*)
Knot (*Calidris canutus*)
Dunlin (*Calidris alpina*)
Sanderling (*Crocethia alba*)
Ruff (*Philomachus pugnax*)
Stone Curlew (*Burhinus oedicnemus*)
Great Skua (*Catharacta skua*)
Great Black-backed Gull (*Larus marinus*)
Lesser Black-backed Gull (*Larus fuscus*)
Herring Gull (*Larus argentatus*)
Common Gull (*Larus canus*)
Glaucous Gull (*Larus hyperboreus*)
Little Gull (*Larus minutus*)
Black-headed Gull (*Larus ridibundus*)
Kittiwake (*Rissa tridactyla*)
Common Tern (*Sterna hirundo*)
Arctic Tern (*Sterna macrura*)
Little Tern (*Sterna albifrons*)
Razorbill (*Alca torda*)
Guillemot (*Uria aalge*)
Puffin (*Fratercula arctica*)
Stock Dove (*Columba oenas*)
Rock Dove (*Columba livia*)
Woodpigeon (*Columba palumbus*)
Turtle Dove (*Streptopelia turtur*)
Cuckoo (*Cuculus canorus*)
Barn Owl (*Tyto alba*)
Little Owl (*Athene noctua*)
Long-eared Owl (*Asio otus*)
Nightjar (*Caprimulgus europaeus*)
Swift (*Apus apus*)

Green Woodpecker (*Picus viridis*)
Great Spotted Woodpecker (*Dendrocopos major*)
Lesser Spotted Woodpecker (*Dendrocopos minor*)
Wryneck (*Jynx torquilla*)
Woodlark (*Lullula arborea*)
Skylark (*Alauda arvensis*)
Shorelark (*Eremophila alpestris*)
Swallow (*Hirundo rustica*)
House Martin (*Delichon urbica*)
Sand Martin (*Riparia riparia*)
Raven (*Corvus corax*)
Carrion Crow (*Corvus corone corone*)
Hooded Crow (*Corvus corone cornix*)
Rook (*Corvus frugilegus*)
Jackdaw (*Corvus monedula*)
Magpie (*Pica pica*)
Jay (*Garrulus glandarius*)
Great Tit (*Parus major*)
Blue Tit (*Parus caeruleus*)
Coal Tit (*Parus ater*)
Marsh Tit (*Parus palustris*)
Long-tailed Tit (*Aegithalos caudatus*)
Nuthatch (*Sitta europaea*)
Treecreeper (*Certhia familiaris*)
Wren (*Troglodytes troglodytes*)
Dipper (*Cinclus cinclus*)
Mistle Thrush (*Turdus viscivorus*)
Fieldfare (*Turdus pilaris*)
Song Thrush (*Turdus philomelos*)
Redwing (*Turdus iliacus*)
Ring Ouzel (*Turdus torquatus*)
Blackbird (*Turdus merula*)
Wheatear (*Oenanthe oenanthe*)
Stonechat (*Saxicola torquata*)
Whinchat (*Saxicola rubetra*)
Redstart (*Phoenicurus phoenicurus*)
Nightingale (*Luscinia megarhynchos*)
Robin (*Erithacus rubecula*)
Grasshopper Warbler (*Locustella naevia*)
Sedge Warbler (*Acrocephalus schoenobaenus*)
Whitethroat (*Sylvia communis*)
Lesser Whitethroat (*Sylvia curruca*)
Willow Warbler (*Phylloscopus trochilus*)
Chiffchaff (*Phylloscopus collybita*)
Goldcrest (*Regulus regulus*)
Spotted Flycatcher (*Muscicapa striata*)
Dunnock (*Prunella modularis*)
Meadow Pipit (*Anthus pratensis*)
Rock Pipit (*Anthus spinoletta*)
Pied Wagtail (*Motacilla alba*)
Yellow Wagtail (*Motacilla flava*)
Great Grey Shrike (*Lanius excubitor*)
Red-backed Shrike (*Lanius cristatus*)
Starling (*Sturnus vulgaris*)
Hawfinch (*Coccothraustes coccothraustes*)
Greenfinch (*Chloris chloris*)
Goldfinch (*Carduelis carduelis*)
Siskin (*Carduelis spinus*)
Linnet (*Carduelis cannabina*)
Twite (*Carduelis flavirostris*)
Redpoll (*Carduelis flammea*)
Bullfinch (*Pyrrhula pyrrhula*)
Crossbill (*Loxia curvirostra*)
Chaffinch (*Fringilla coelebs*)
Brambling (*Fringilla montifringilla*)
Corn Bunting (*Emberiza calandra*)
Yellowhammer (*Emberiza citrinella*)
Reed Bunting (*Emberiza schoeniclus*)
Snow Bunting (*Plectrophenax nivalis*)
House Sparrow (*Passer domesticus*)
Tree Sparrow (*Passer montanus*)

Appendix B—Species in which melanism has been recorded in the wild in the British Isles

Mallard (*Anas platyrhynchos*)
Wigeon (*Anas penelope*)
Pochard (*Aythya ferina*)
Shelduck (*Tadorna tadorna*)
Buzzard (*Buteo buteo*)
Rough-legged Buzzard (*Buteo lagopus*)
Honey Buzzard (*Pernis apivorus*)
Marsh Harrier (*Circus aeruginosus*)
Montagu's Harrier (*Circus pygargus*)
Kestrel (*Falco tinnunculus*)
Red Grouse (*Lagopus lagopus scoticus*)
Partridge (*Perdix perdix*)
Red-legged Partridge (*Alectoris rufa*)
Pheasant (*Phasianus colchicus*)
Water Rail (*Rallus aquaticus*)
Lapwing (*Vanellus vanellus*)
Ringed Plover (*Charadrius hiaticula*)
Snipe (*Gallinago gallinago*)
Woodcock (*Scolopax rusticola*)
Curlew (*Numenius arquata*)
Redshank (*Tringa totanus*)
Dunlin (*Calidris alpina*)
Lesser Black-backed Gull (*Larus fuscus*)
Herring Gull (*Larus argentatus*)

Black-headed Gull (*Larus ridibundus*)
Great Spotted Woodpecker (*Dendrocopos major*)
Woodlark (*Lullula arborea*)
Skylark (*Alauda arvensis*)
Swallow (*Hirundo rustica*)
Magpie (*Pica pica*)
Jay (*Garrulus glandarius*)
Great Tit (*Parus major*)
Blue Tit (*Parus caeruleus*)
Coal Tit (*Parus ater*)
Mistle Thrush (*Turdus viscivorus*)
Song Thrush (*Turdus philomelos*)
Wheatear (*Oenanthe oenanthe*)
Redwing (*Turdus iliacus*)
Stonechat (*Saxicola torquata*)
Chiffchaff (*Phylloscopus collybita*)
Pied Wagtail (*Motacilla alba*)
Yellow Wagtail (*Motacilla flava*)
Bullfinch (*Pyrrhula pyrrhula*)

Appendix C—Scientific names of species mentioned in the text but not included in Appendix A or Appendix B

Little Egret (*Egretta garzetta*)
Scarlet Ibis (*Guara rubra*)
Flamingo (*Phoenicopterus ruber*)
Canada Goose (*Branta canadensis*)
Rough-legged Buzzard (*Buteo lagopus*)
Short-tailed Hawk (*Buteo brachyurus*)
Eleanora's Falcon (*Falco eleanorae*)
Gabar Goshawk (*Micronisus gabar*)
Turkey (*Meleagris gallopavo*)
Ivory Gull (*Pagophila eburnea*)
Spotted Dove (*Streptopelia chinensis*)
Collared Dove (*Streptopelia decaocto*)
Grey Parrot (*Psittacus erithacus*)
Desert Lark (*Ammomanes deserti*)
Purple Martin (*Progne subis*)
Blue Jay (*Cyanocitta cristata*)
Mockingbird (*Mimus polyglottus*)
Wood Warbler (*Phylloscopus sibilatrix*)
West Indian Bananaquit (*Coereba flaveola*)
Red-crowned Bishop (*Euplectes bordeacea*)
Java Sparrow (*Padda oryzivora*)
Red-winged Blackbird (*Agelaius phoeniceus*)
Great-tailed Grackle (*Cassidix mexicanus*)
Brewer's Blackbird (*Euphagus cyanocephalus*)
Canary (*Serinus canarius*)

Robin recaptures on Fair Isle

By Peter Davis

Fair Isle Bird Observatory

On Fair Isle, Shetland, it is the normal practice to weigh all migrant birds at the time they are first trapped, and at any subsequent recaptures. The information is stored in a card-index, with all the data for each individual on a single card. In this way, we have accumulated a good deal of information on the recovery of weight lost during migration, and also on the length of stay of the migrants during their recuperation.

The Robin (*Erithacus rubecula*) has been chosen as a suitable subject for analysis. This is a typical small Continental night-migrant and it has yielded more data than any other species in this category. There is no local breeding population to complicate matters, and though there is usually a very small wintering population, this is not regular

in the sense that individual birds return in successive years; its size is related to the strength of the autumn passage and to the mildness or otherwise of the late autumn weather. The fact that Robins do winter successfully shows that the island offers reasonably good feeding, even at the barest time of the year, and it may be assumed that the halted migrants find it reasonably hospitable.

There are apparently two peaks of Robin migration in the spring, the first in late March and early April and the second in the first half of May; so far there have been no significant falls outside these periods. Judging from a few overseas recoveries, and from the weather situation and the other species occurring at the time of the arrivals, the birds of the first period (which occur more regularly) belong to the stock which migrates between Scandinavia and Iberia; and those of the second batch belong to a population which moves into Europe from the south-east in spring, and occasionally crosses the North Sea by overshooting. This population may breed a good deal later than the first; at any rate the weights of these birds do not appear to differ from those of the earlier migrants. At the present we have too little recapture information to make it practicable to divide the spring birds into two categories in the analysis. In autumn there is only one peak period, in the first half of October, and there have been no falls of any size outside that month. Recoveries indicate that autumn birds are of Scandinavian stock.

In choosing the data for examination, it was necessary to apply a rigorous selection which considerably reduced the samples available. Only those birds which were thought to be freshly arrived when first trapped were used. This was determined by checking the migration log, and discarding all records except those on days when Robins appeared after a period with few or no occurrences. There remained 43 recaptures of 33 spring birds, all within twenty days of arrival, and 53 recaptures of 36 autumn birds, up to an arbitrary limit of thirty days after arrival (one bird caught when newly arrived subsequently overwintered, and others were retrapped up to 60 and 44 days).

Before attempting to draw any conclusions from the recapture data, it is desirable to know if the birds offering themselves for recapture are representative of the migrant population as a whole, or if they are only the more feeble individuals. A simple way of checking this is to compare the mean weights of large samples of freshly arrived Robins with the arrival weights of those which were subsequently recaught. Accordingly, the weights of 150 spring and 200 autumn Robins, all birds trapped on days when few or no halted migrants from earlier falls were present, were abstracted from the ringing records. The result was a most striking correlation between the mean arrival weights. In spring the average for all newly arrived Robins was 15.5 gm.

(range 12.3 to 18.8) and for the 33 which were later retrapped it was also 15.5 (range 12.3 to 17.2). In autumn the average for all Robins was 14.9 gm. (11.7 to 18.8), and for the 36 later recaught it was also 14.9 (12.5 to 18.0). Thus there is no reason to suppose that the retraps were in worse shape than the rest.

Since the recapture data were insufficient for a day-by-day analysis of recapture weights, the figures were grouped in periods of several days. On the few occasions when an individual was caught more than once within each group of days, the mean of its recapture weights was used. Even after grouping, the samples are too small and the conclusions are therefore tentative and exploratory. They are logical, however, and accord with what one would expect to happen, so that it is likely that larger samples would confirm the results. The ideal would be a long series of birds retrapped at frequent intervals throughout their stay, but experience has shown that this would take many years to accumulate. A few individuals which were retrapped several times are discussed below. The data for both spring and autumn are summarised in Table 1.

TABLE 1—WEIGHT INCREASES OF MIGRANT ROBINS (*Erithacus rubecula*) ON FAIR ISLE IN SPRING AND AUTUMN

Day 0 is the day of arrival. No birds were retrapped after Day 20 in spring and only four in autumn; the latter had all been handled earlier and it was evident that they had regained their normal weight before Day 20

	Spring				Autumn			
	Size of sample	Initial weight	Recapture weight	Percent gain	Size of sample	Initial weight	Recapture weight	Percent gain
Days 0-2	20	15.6	15.7	1	16	14.8	14.7	−1
Days 3-5	10	15.8	17.4	10	10	14.7	16.6	13
Days 6-10	5	14.8	17.4	18	8	15.1	17.0	13
Days 11-20					10	14.9	17.4	17

Very few of the individuals upon whose weights the table is based were retrapped more than once. One spring bird, however, was weighed five times in the early days after arrival. Its original weight was 17.2 gm.; on Day 1 it was 16.8, on Day 3 16.9, on Day 4 18.3, and on Day 5 19.7. Another spring bird leapt from 14.9 gm. on arrival to 18.6 on Day 3, and was at 18.3 on Day 5. The only two spring birds which stayed as long as twenty days were also handled several times; both were perhaps in poor health, however, for they showed only moderate increases in the early stages and fluctuated about rather low weights towards the end of their stay. In autumn four birds were handled on three or more occasions before Day 20. One weighed 13.1 gm. on arrival, 15.7 on Day 6, 17.6 on Day 10 and 16.4 on Day 19; the second weighed 15.3 on arrival, 17.2 on Day 4

and 22.1 on Day 18; the third was at 14.5 initially, 15.0 on Day 1, 15.8 on Day 7 and 15.5 on Day 8; and the fourth increased from 14.6 originally to 15.4 on Day 2 and 18.2 by Day 8, but fell to 17.7 by Day 12.

CONCLUSIONS

The following tentative conclusions are made from the data:

(1) In both spring and autumn there is normally a pause of up to two days before weight lost on migration starts to be regained. Ten of the twenty spring birds examined during this period had lost weight, the larger decreases being from 17.1 to 13.4 gm. and from 16.2 to 15.0 gm., both on Day 1; the biggest increases were from 14.4 to 18.1 gm. (Day 1) and from 15.6 to 17.6 gm. (Day 2). Similarly, nine of sixteen autumn birds in the first grouping had lost weight, the biggest decreases being from 15.7 to 14.5 and from 15.9 to 14.5, both on Day 1; the best gains were from 12.5 to 14.4 and from 16.7 to 18.5, also both on Day 1. The majority of the changes in either direction, at both seasons, were of less than half a gram, however. The reason for the pause before weight is regained is obscure, but it is perhaps unlikely to be a physiological one, since many birds can achieve satisfactory increases. The losses may be connected with the noticeable friction among newly arrived Robins; perhaps a bird must establish a territory before settling down to feed intensively.

(2) Most Robins recover sufficiently to resume passage before the fifth day after arrival. This is confirmed by the daily census figures, though here it is seldom possible to be certain that the same population is being counted on successive days. The figures suggest that many Robins can resume passage within two or three days, though frequently whole movements appear to be halted for longer than this.

(3) The spring migrants are in a greater hurry than the autumn ones. Only seven out of 33 spring birds were recaptured after Day 4, against sixteen out of 36 autumn captures. The totals will be affected to an unknown extent by dispersal outside the trapping area and by trap-shyness after first capture, but this should apply equally to both spring and autumn.

(4) Spring birds are heavier than autumn ones, but most do not regain proportionately so much weight before leaving. This is presumably connected with the greater urgency of the spring passage, though it is also possible that less food is available in spring than in autumn.

(5) It is unlikely that most migrants wait to regain all the weight lost on passage before moving on. The highest average weights, and many of the highest individual weights, were those of the birds which stayed longest. This is most clear from the autumn figures, but the same tendency is apparent in spring.

(6) Average weight-loss on passage to Fair Isle exceeds 10% in spring and 13% in autumn. To judge from the gains made by the birds which stayed longest, the true figure may be in excess of 17%; but this could only be determined by comparing the Fair Isle weights with series from the areas of origin at the appropriate seasons. A figure of about 20% would seem remarkably low when one considers that the migrants will have made a sea crossing of at least 300-400 miles, and in some cases may have flown considerably further. Individual Robins have regained considerably more than 20% of their arrival weight while resting on the island. Among the autumn birds, three regained between 20% and 30%, five between 30% and 40%, and one 44%. In spring, when there are few data because of the short stay of most birds, three regained 24%, 26% and 40% respectively. These birds were all capable of recovery after arrival. One may assume, therefore, that many Robins are capable of undertaking much longer flights than those involved in the crossing to Fair Isle, though a few are taxed to the limit of their reserves and occasional deaths from exhaustion have been recorded.

Post-fledging behaviour of Choughs on Bardsey Island

By Susan Cowdy

THE CHOUGHS (*Pyrrhocorax pyrrhocorax*) of Bardsey Island, off the coast of Caernarvonshire, have been a constant source of interest since the bird observatory opened there in 1953. One or two pairs have nested in most years and forty-seven young have been successfully raised. These have all been ringed, but so far not one has returned to breed and the only two recoveries have been local (one from Portmadoc, 14 miles away on the mainland). In some years nestlings have been found dead in the nest or fledglings have died during their first week out. The reason for this is at present unknown, though in 1958 an adult female died on her nest and examination showed the apparent cause to be *Pasteurella pseudo-tuberculosis*.

In June 1958 I made detailed observations on the behaviour of a brood of young from the day they first left the nest. The pair concerned bred in a small cave some sixty feet above the sea and fifteen feet below the cliff top, laying four eggs and rearing four young. It was possible to watch their activities from an arm of cliff facing the site and about forty yards from it. Both adults were remarkably

tame, no doubt having become immune to intrigued bird-watchers through the years. When the young were still in the nest, the parents came together to feed them every twenty minutes; Whittaker (1947) and Williamson (1959) have pointed out that it is customary for Chough pairs to hunt in company and visit the nest-site together, but the feeding visits at two nests watched by the latter on the Isle of Man were much less regular than on Bardsey, the intervals varying from eight to sixty minutes (though it should be added that all intervals of over thirty minutes were at a nest with only one chick).

On 7th June 1958, at 0930 GMT, the first fledgling was seen out of the cave. After this I visited the site at the same time on each of the next ten days, for periods of up to two hours. On that first morning three of the young were sitting at the cave entrance and the fourth was on a ledge a few feet above. Both adults were at the top of the cliff and calling repeatedly. The fledgling out of the cave attempted to reach them by flying a few feet and then scrambling and fluttering up the cliff face. One adult flew down and disappeared into the cave, but it reappeared immediately and, uttering a harsh scolding note which I had not previously heard, returned to the adventurous fledgling which was now at the cliff top. From here the old bird flew repeatedly to and from the cave, calling continually and obviously trying to entice the youngster back. Eventually it obeyed, and scrambled and slipped its way down the cliff once more. Similar calling back to the cave was noted by Raven (1929).

The next day the four young were again out of the nest, but this time they all remained on the ledge at the entrance to the cave. When the female arrived with food, they clamoured around her. She fed them by lowering her head to regurgitate and then thrusting her bill down their throats. Afterwards she cleaned her beak on a rock with vigorous side-to-side strokes before departing with the male who had remained close by. The young made no attempt to leave the ledge and one pecked idly at a clump of sea pinks.

On each of the next five mornings, though still not strong on the wing, they got well away from the nest. They stayed close together, but moved distances of up to a hundred yards. Sometimes they were at the top of the cliff and sometimes among the rocks below, but they were always within reach of cover and, when the adults left them, they immediately hid themselves out of sight in rock crevices (Raven also referred to juveniles entering crevices, though for different reasons). Sometimes they hid apart and then they maintained contact by repeating from time to time a single call which I noted down as *wa-ake*. On 12th June, five days after the first youngster appeared out of the cave, three of the fledglings were seen accompanying their parents on a short flight along the cliff over the sea. They flew in an erratic manner,

diving at the adults who had to side-slip to avoid them; all were calling, but the voices of the young were quite distinct. They returned and the performance was repeated, but still only three young took part; the fourth stayed on the cliff. There was considerable variation in size and plumage development at this time and the fourth bird was not only markedly smaller but showed about an inch of quill at the base of the tail. This seemed to suggest that the young were hatched over a period of several days and, therefore, that incubation began with the first egg as stated in *The Handbook* and also by Guichard (1962), but Ryves (1948) clearly ascertained that incubation did not start until the last egg had been laid and in this connection it is interesting to note that the brood studied by Raven all showed quills to a similar extent.

During the breeding season the Bardsey Choughs seem to feed mainly on ants (and presumably their eggs). Ants have been the only insects found whenever we have inspected a feeding area directly the birds have left. The only pellet found at the nest consisted solely of remains of ants, and Raven also referred to these insects being taken. The birds dig into the short turf, pulling it back towards them and making holes up to two inches deep. It was not until the fifth day after fledging that the young were encouraged to forage for themselves (and they were still sometimes fed by regurgitation for several days after that). The old birds turned over small clods of earth and moved away to allow the young to come in and pick up the exposed food for themselves. At first they did not seem to realise what was happening and, calling wheezily with wide open bills and quivering wings, they continued to beg from their parents. On such occasions, however, the latter paid little heed, turning round and moving out of the way.

When first out of the nest, the young were more often fed by the female, a slighter bird than the male who usually stood by. She would regurgitate eight or nine times, the most demanding fledgling always getting the food. Afterwards there was usually a long spell of bill-wiping and preening. At times the adults preened each other round the head and base of the bill, where the feathers often become soiled and matted. On several occasions the female displayed to the male after feeding the young, stretching and quivering her wings and calling continuously. Courtship-feeding at such times was also noted by Williamson; Whittaker recorded it as well, but in the pre-nesting period.

The adults foraged for much of their food on the mountain half a mile or more from the nest. It was not until the sixth day after fledging that the young first attempted to follow on one of these excursions; two then flew out of sight, but all four returned, calling loudly, after two or three minutes. The next day three of the young

accompanied the adults to the mountain and on the day after that, the eighth after fledging, the whole family was together there, about a mile from the nest-site. From then on they spent most of the day on the mountain and the brood divided, each parent being accompanied by two young. They still kept up their continuous begging, but the adults seldom fed them now and seemed intent on uncovering insects for them to pick up.

The family still used to return to the nest-site about five or six times a day and the young apparently roosted there for the rest of the month. From the tenth day after the brood fledged, however, the adults roosted apart in another cave about a hundred yards away.

Observations were made on relations between the Choughs and other species. They often attacked a hovering Kestrel (*Falco tinnunculus*) and even drove it away quite fiercely. Herring Gulls (*Larus argentatus*) and Carrion Crows (*Corvus corone*) were occasionally chivied in a desultory manner if they came near the nest area, but in 1961 a pair of Carrion Crows bred within twenty yards of the Choughs and no antagonism either way was seen. On the Isle of Man Williamson found that Choughs frequently associated with Hooded Crows (*C. c. cornix*) when foraging. The only birds which were really seen to disturb the Choughs on Bardsey were Ravens (*C. corax*). For example, when five Ravens flew over the nest-site after the young had fledged, the Choughs called agitatedly, fed the young more quickly than usual and left the vicinity hurriedly. However, Williamson did not regard the Raven as an enemy of the Choughs on the Isle of Man where Peregrines (*Falco peregrinus*) are probably their only predators.

The one other bird which should particularly be mentioned here is the Jackdaw (*C. monedula*), the species most similar in size and some of its habits, and therefore often blamed for the Chough's decline in many parts of Britain. Williamson and Ryves, in the Isle of Man and Cornwall respectively, both found that Choughs and Jackdaws were using quite different types of nesting sites and feeding in different areas. On Bardsey the two species often feed together, but closer observation shows that the Choughs confine themselves to patches of short grass along the edges of outcrop rocks while the Jackdaws forage in the turf among the gorse bushes. They certainly choose different nest-sites, too, though often these are side by side. The Chough is contented with a concealed ledge or crevice, while the Jackdaw likes more closed holes. One pair of Choughs breeds annually in a cave surrounded by rabbit burrows and holes frequented by Jackdaws. At no time have I seen any antagonism between the two species. The brood I watched were with a party of Jackdaws only a fortnight after fledging; flying in a strong wind, they appeared

to be playing together though the Chough family stayed close to each other.

SUMMARY

In June 1958 a family of Choughs (*Pyrrhocorax pyrrhocorax*) on Bardsey Island, Caernarvonshire, was regularly watched from the day the four young left the nest. On the experience of this brood, it seems that Choughs do not become strong on the wing until about five days after fledging and do not leave the general nesting area for a further two days. While the adults are away foraging (apparently mainly for ants), the young hide in crevices among the rocks; presumably this is a precaution against predators, though Ravens are the only birds that have been seen to agitate the Choughs on Bardsey. The young are fed by regurgitation for at least a week after fledging, but from the fifth day they are encouraged to pick up food unearthed for them by the adults. At this stage the fledglings begin to accompany the old birds to feeding grounds up to a mile away, but they are brought back to the nest area several times a day and continue to roost there for about the next two months.

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Notes

Red-legged Partridge paddling in the sea.—On 24th March 1962, at Hunstanton, Norfolk, I saw a Red-legged Partridge (*Alectoris rufa*) standing in the shallow waves of the incoming tide about 250 yards below high water mark. It was a warm, dry afternoon and the sea was very calm. The water was washing the bird's belly, but as the tide encroached so it walked shoreward, keeping to a depth of about 2½ inches. It made no attempt to immerse itself or flap water over its back, but this was perhaps due to my proximity and its consequent alertness. After watching it for about seven minutes, I walked forward and it flew off into the dunes. C. A. E. KIRTLAND

Sociable Plover in Dorset.—A male Sociable Plover (*Chettusia gregaria*) frequented meadows and arable fields in the valley of the River Allen, one to two miles north of Wimborne, Dorset, between 6th and 24th April 1961. It was first discovered by J.W.R. in a riverside meadow and he found it there again on the 10th, eventually enabling many other observers to see it in various fields within an area of about one square mile. Although often difficult to find, seeming to vanish sometimes for several days on end, it was recorded on at least nine different dates. The following account is compiled from detailed notes contributed by Dr. J. S. Ash and the Rev. G. W. H.

Moule (11th), M. J. McVail (13th), M. Terry (22nd) and A. J. Bull (24th), in addition to those of J.W.R. (6th, etc.) and K.B.R. (10th):

Size and build: on the ground, compared with Lapwings (*Vanellus vanellus*), it seemed slightly larger, with heavier head and body, rather shorter, thicker neck and more pigeon-like shape; at times it looked unexpectedly plump; longer legs, though usually hidden by grass, made it distinctly taller than Lapwings; bill straight, slender, considerably shorter than head and normally held horizontally; crown rather flat-topped and no crest; closed wing-tips reached to end of tail or just beyond. In flight, looked a trifle smaller than Lapwings; wing-shape rounded, rather Lapwing-like, but somewhat narrower, more pointed, lacking "fingered" tips; from below, feet clearly seen to project a little beyond square-ended tail on several occasions. *Upper-parts:* crown cap-like, jet black; forehead and broad superciliary stripes, the latter meeting on nape, usually looked pure white, but creamy white or faintly tinged buff in some lights; mantle and scapulars uniform greyish, variously described as pale buffy-grey, soft dove-grey, woodpigeon-grey, drab-grey, ash-grey, blue-grey and clear grey; rump (in flight) apparently as mantle in centre, but white at sides; upper tail-coverts white. *Sides of head and neck:* well-marked black stripe from bill to eye; indistinct narrow black streak behind eye; cheeks, ear-coverts, sides of throat and neck pale buff, usually looking warm buff, or pinkish buff in evening sunlight, with a suggestion of plum-colour at junction of neck with greyish mantle. *Under-parts:* buff throat merged into pale grey (or buffy-grey) upper breast, sides of which were practically uniform with mantle and scapulars; breast shaded into a conspicuous black belly-patch which merged into dark chestnut near vent (the two colours usually not clearly distinguishable, whole area often appearing almost black or very dark chocolate-brown); under tail-coverts white. *Tail:* white, with broad black sub-terminal band not extending to outer feathers. *Wings:* at rest, visible parts of folded wings (except for black primary tips) usually looked almost uniform with breast and mantle, but in close views coverts (lesser and median?) were seen to be less grey, almost brownish drab, and some darker "smoky" marks were noticed once; in flight, striking upper wing-pattern very like immature Sabine's Gull (*Xema sabini*), with black primaries (and their coverts), white secondaries (and tips of greater coverts?), and drab or greyish remaining coverts and innermost secondaries. *Soft parts:* bill blackish; eye dark; leg colour usually difficult to see, dark but not pure black, once appearing grey with flesh tinge.

Though sometimes rather silent, it quite often called in flight, especially when first flushed (alarm?) or anxious—a rasping note, harsh but not very loud, usually uttered three times in succession with a pause before repetition, sounding like *etch-etch-etch*, *ketch-ketch-ketch*, or possibly *reck-reck-reck*. One evening (10th), the two of us also heard this note used repeatedly in obvious threat, starting as the bird ran towards us from 50-100 yards away, then speeding up into an angry chattering *etchetchetchetch* . . . or *rekrekrekrekrek* . . . in each of several astonishing low-level "attack-flights" which were aimed at our heads and pressed resolutely home to within a few yards of us, every bit as if we had been unwelcome intruders on its breeding-ground. Evidently its motive in approaching us was far from "sociable". Towards Lapwings, its attitude was distinctly ambivalent: quite

often it seemed partial to their company, associating loosely with them in flight or on the ground, but this was an inconstant and almost casual relationship; frequently it shunned them on the ground or flew independently; sometimes it was alternately aggressive and tolerant of their proximity. Much of its time was spent resting and preening, but when feeding it was more active and faster-moving than any Lapwing, running with short quick steps, stopping abruptly, then tilting forwards to pick up food, with tail up-raised, in true plover style. When feeding on plough it was seen to be making rapid bobbing body-movements while trampling (or pattering) the ground, apparently with one foot at a time.

It was generally rather shy, but with caution could often be watched in the open at ranges down to 200 yards, sometimes at 100 yards or less. Once, when suddenly startled at 50 yards range by J.W.R. clapping his hands, it crouched like a Partridge (*Perdix perdix*) instead of flying. Its usual flight was distinctly Lapwing-like, but rather more direct, less wavering, with more frequent wing-beats; it tended to keep fairly low over short distances, but on longer flights, of half a mile or more, it often flew at a considerable height. When taking off, its wing-shape and action were more reminiscent of a Stone Curlew (*Burhinus oedicnemus*) than a Lapwing; starting with fairly rapid beats, flying low and direct, it quickly ascended and then flew in its usual way. Its striking upper wing-pattern normally made it conspicuously distinct from Lapwings in flight, even at very long range; from below, it looked mainly white with prominently contrasting dark belly-patch and primaries. Its general appearance on the ground was totally unlike a Lapwing's, but at long range, partly hidden by grass, it could easily have been taken for a Woodpigeon (*Columba palumbus*). In similar conditions, but head-on with neck up-stretched, the dark belly-patch was conspicuous and seemed to extend on to the lower breast, twice causing it to be mistaken momentarily for a male Partridge. In the open, side view, the dark belly was noticeable at a distance when the bird otherwise looked almost uniform pale grey. At ranges below 300 yards the distinctive head-markings were usually clearly visible through binoculars.

There seems little doubt it was a male in summer plumage; the brownish shade and markings on the coverts suggest first-summer rather than adult, agreeing with the general rule that most such vagrants are young birds. This appears to be the sixth authentic record of the Sociable Plover in the British Isles and the first in spring, assuming *The Handbook* records from Kent (1907) and Sussex (1910, 1914) are now formally rejected (see P. A. D. Hollom, *The Popular Handbook of Rarer British Birds,* 1960, pp. vi and 38).

J. W. Riley and K. B. Rooke

Sociable Plover in Hertfordshire.—At about 1.45 p.m. on 29th October 1961, on a large expanse of mud at Wilstone Reservoir, Tring, Hertfordshire, we found an unfamiliar wader which we later identified as a Sociable Plover (*Chettusia gregaria*) in winter plumage. It was with a small flock of about fifty Lapwings (*Vanellus vanellus*) and we watched it for about ten minutes under perfect field conditions, using modern telescopes with a 35× magnification, down to a range of 60 yards. Some of the Lapwings and the Sociable Plover then left the main flock, flew away westwards and were not seen again. Only a brief view was obtained of the bird in flight.

In general appearance it resembled a long-legged Golden Plover (*Charadrius apricarius*) in winter plumage. It seemed slightly smaller than the Lapwings and on the ground it looked a slimmer bird with a more upright stance. The upper-parts appeared a uniform olive-brown, with the crown distinctly darker than the back. There was a conspicuous pale buff eye-stripe, the lower throat and upper breast were mottled brown and buff, and the lower breast and belly were white. The primaries were black, and the tail white with a broad black subterminal band. The head was rounded, with no trace of a crest. The bill was straight, slender, almost as long as the head, and dark like the legs and eyes. In flight the wings were narrower and more pointed than those of the Lapwings, and the wing and tail pattern was most striking: the white secondaries showed up as a broad white panel against the black primaries, and the underwing appeared white. When the wings were closed, the white secondaries were not visible, but the black primaries were most conspicuous. No call-note was heard.

This is the first record of the Sociable Plover in Hertfordshire.

T. R. E. Devlin, A. R. Jenkins and L. Lloyd-Evans

Herring Gull with abnormal bill.—On 18th April 1961, while I was trapping gulls on Skomer Island, Pembrokeshire, I caught an adult Herring Gull (*Larus argentatus*) with an abnormal bill. The tip of the upper mandible had in some way been broken off, allowing the lower mandible to become about 18 mm. longer than usual. As shown by D. E. Pomeroy in his paper on "Birds with abnormal bills" (*Brit. Birds,* 55: 49-72), such conditions are rare in non-Passerine species. This is the only deformed bill I have seen in handling 426 full-grown and 2,615 young Herring Gulls, 370 Lesser Black-backed Gulls (*L. fuscus*) and 229 Great Black-backed Gulls (*L. marinus*). For this reason, and because I made a detailed examination of the bird after deciding to kill it, the case seems worth placing on record.

Plate 48b shows a photograph of the head. The elongation of the lower mandible had occurred only in the sheath, the skeleton itself

being unaltered. The plumage was in a good state and there were not excessive numbers of Mallophaga. On dissection, it was found to be a female in breeding condition with a weight of 760 gm., which is well within the usual range. The stomach was empty except for a few corn husks and a single matchstick, but the gut contained some beetle remains. From the bird's general condition I concluded that it had been leading a normal life. M. P. HARRIS

Short-toed Lark with abnormal bill.—Since D. E. Pomeroy (*Brit. Birds,* 55: 49-72) apparently had very few weights of birds with deformed bills, it seems worth recording the following. A male Short-toed Lark (*Calandrella cinerea brachydactyla*) with a slightly aberrant bill was shot while probably still on migration on the island of Rhodes in the Aegean Sea on 17th April 1959. Its upper mandible had begun to grow over the lower and had twisted slightly to the right, creating an incipient crossed bill. The aberration was hardly noticeable from above, but from below (plate 48a) it could be seen that the entire overhang of the upper mandible lay outside the mid-line of the lower. The overhang was 1.5 mm. long; usually the two mandibles are of about the same length in this species. The wing length (95 mm.) was normal for a male of this population, but the weight was only 16.7 gm. This was 7.4 gm. (or 30%) less than the average of ten other specimens collected in Greece and Turkey; two other males shot at the same time weighed 26 gm. and 27 gm., and the lowest of the remaining weights was 21 gm. These figures suggest that the slight aberration in the bill drastically impaired its efficiency as a feeding organ. Unfortunately, however, no observations were made on the bird's behaviour before it was killed. In spite of this handicap, it had apparently been able to migrate north from its winter quarters in North Africa. GEORGE E. WATSON

Barn Owls catching sparrows at roost.—Although Barn Owls (*Tyto alba*) are known to catch birds, including House Sparrows (*Passer domesticus*), when the opportunity offers, the following instance of a pair taking advantage of artificial lighting in order to do so seems to be extremely unusual. In 1958 there was a large roost of several hundred House Sparrows in oleander bushes surrounding the lawns of the social club at the Alwand Oil Refinery, Khanaqin, Iraq. The lawns and the bushes were floodlit until late at night, and each evening from May until the end of July one or both of a pair of locally resident Barn Owls came to feed on the sparrows. The owls would sit quite openly in one of the adjacent eucalyptus trees and then drop swiftly down to the bushes. Invariably they were successful in catching a sparrow apiece in the ensuing panic and these they carried off to their

vantage point in the tree to eat. As soon as the sparrows had quietened down again they would repeat the performance. Sometimes this method of hunting continued for an hour and occasionally longer. Although regularly hunting in the floodlighting, these owls were never seen in daylight. BRYAN L. SAGE

Budgerigars clinging to intruding Barn Owl.—One morning in March 1962, when going to release the free-flying Budgerigars (*Melopsittacus undulatus*) which I keep at Margaretting, Essex, I found a Barn Owl (*Tyto alba*) fluttering inside the flight. The bird had entered by a small door which had somehow opened during the night. I left the aviary to get a fishing net in which to catch it. On my return, it had left the flight and was perching in the shelter, but only its beak was visible, as all over it clung Budgerigars! They were quite stationary and not attempting to peck it. On putting the net over the owl I also captured about thirty Budgerigars. I kept the owl for the day and released it in the evening. ROSEMARY UPTON

Kingfisher trapped by frost.—At about 8.30 a.m. on 28th December 1961, at Mill Hill Golf Links, Middlesex, I found a Kingfisher (*Alcedo atthis*) stuck by frost to a narrow iron pipe over a stream. Still alive, it was hanging upside down by its left leg which was broken in two places. I freed the bird and took it home, where I found that it could fly but not, of course, walk. I attempted to feed it on small pieces of fish, but it died on 30th December. D. MASSEY

[Although roosting birds are not infrequently trapped by ice on perches in hard weather, it seems unlikely that this Kingfisher had been roosting where it was found. The adhesive quality of frost or ice on some metals is well known and it is quite possible that the bird merely perched for a short while.—EDS.]

Song Thrush floating on the sea.—On 31st December 1961, at Portland Bill, Dorset, we noticed a small bird on the sea about thirty yards offshore. It was facing us and at first we thought that it must be a Little Grebe (*Podiceps ruficollis*), but then we realised that it was a Song Thrush (*Turdus philomelos*). The sea was calm and it showed no sign of distress, sitting with its head and tail held well up. After watching it for at least a minute, however, we concluded that it must be waterlogged. Then suddenly it flew up, springing from the surface like a Teal (*Anas crecca*), and settled on the cliff a few yards from where we were standing. After a brief rest it flew off along the cliff top.
D. C. MOLE and R. CHAINEY

[There have been a number of observations of land birds settling

on open water in recent years, the species concerned ranging from Golden Plover (*Charadrius apricarius*) (*Brit. Birds,* 54: 116) to Reed Bunting (*Emberiza schoeniclus*) (*Brit. Birds,* 52: 238), and it seems clear that such behaviour is less unusual than might otherwise have been supposed.—EDS.]

Willow Warbler attacking posturing Robins.—On 23rd April 1962, at Ashbourne, Derbyshire, I was watching a Willow Warbler (*Phylloscopus trochilus*) feeding and singing, when two Robins (*Erithacus rubecula*) suddenly appeared in an adjoining tree. Both were singing and behaving aggressively, although not actually attacking each other. After about a quarter of a minute the Willow Warbler flew to within three feet and faced them, still singing. At this moment one of the Robins attacked the other. Two or three seconds later the Willow Warbler flew behind the attacker and gripped one of its tail feathers in its beak, holding on for at least a second. This Robin attempted to drive the Willow Warbler away, but the latter continued to fly menacingly towards it each time it attacked the other. In all the Willow Warbler made five attacks, continuing to sing between each one, before it was driven away and the Robins separated.

P. D. R. LOMAS

House Sparrow feeding young on cuckoo-spits.—The note by N. L. Hodson on Swallows (*Hirundo rustica*) feeding on froghoppers (*Brit. Birds,* 55: 166) reminds me of an observation I made in June 1933 at Great Bridge, Staffordshire. A hen House Sparrow (*Passer domesticus*) was feeding fledged young on immature froghoppers which she obtained by pecking them out of the frothy cuckoo-spit on rosebay willowherb (*Chamaenerion angustifolium*). The incident was recorded at the time (*Ann. Rep. N. Staffs. Field Club,* 68: 125). It aroused some entomological interest and was more fully reported in *Extracts from Proc. R.E.S.,* ix: 30-31, where it was concluded that the insect concerned was *Philaenus leucophthalmus.* F. FINCHER

Letters

Black-headed Gulls eating acorns

Sirs,—With reference to earlier notes on the subject of Black-headed Gulls (*Larus ridibundus*) eating acorns (*Brit. Birds,* 50: 75 and 347; 54: 118 and 130-131), I should like to point out that the late Humphrey Swann recorded similar behaviour on the River Fal in Cornwall in 1948 (*Field,* 19th March 1949: 330). I quote: ". . . it is only blackheads that I have seen taking acorns from the tree, and even they find

great difficulty in detaching the acorn while on the wing. The nut has to be dead ripe, hence the harvest must be carried out within about four days. Last year there was a bumper crop, and up the Fal, where the water is overhung by scrub oak, the acorns were pattering into the water like rain, with the gulls swooping on them and picking them out of the water as if they were fry." C. J. STEVENS

"Kingfisher ducking Kingfisher"

Sirs,—The following observation seems of interest in connection with the recent note by G. H. Forster on Kingfishers (*Alcedo atthis*), which was published under the above title (*Brit. Birds,* 55: 43). On 3rd January 1962, at Newport, Isle of Wight, D. D. Driscoll saw a Kingfisher continually diving down at an object floating in the River Medina where it flows past a sawmill. When the object came closer, carried on fresh water at low tide, it proved to be another Kingfisher. He recovered the bird, but it was dead and so he brought it to me. There was no sign of external injury and, of course, no evidence that it had been killed by the first Kingfisher. Nevertheless, the facts are at least suggestive in the light of Mr. Forster's observation.

B. SHEPARD

Foot-trembling in plovers, herons and a passerine

Sirs,—From my experience in Australia, I can add several species to the lists published by K. E. L. Simmons (*Brit. Birds,* 54: 34-39 and 418-422) of birds addicted to foot-trembling. The Red-capped Dotterel—the Australian race (*ruficapillus*) of the Kentish Plover (*Charadrius alexandrinus*)—foot-trembles occasionally and the Black-fronted Dotterel (*Ch. melanops*), a freshwater plover, does so frequently. I have also seen a small passerine, the Flame Robin (*Petroica phoenicea*), foot-trembling on close-cropped grass (*Emu,* 54: 278-279).

Simmons should perhaps have mentioned that some herons also have this habit, as distinct from the two-footed paddling he referred to; A. J. Meyerriecks recently dealt with this subject (*Wilson Bull.,* 71: 153-158). Digressing here, there may be some significance in the fact that Meyerriecks apparently found foot-trembling common in both the Snowy Egret (*Egretta thula*) and the Little Egret (*E. garzetta*), which are sometimes considered conspecific, but absent in the Great White Heron (*E. alba*)—a field identification point? Incidentally, he also suggested that this habit might be related to the bright yellow feet which Snowy and Little Egrets both have, but, although he cited Australian records, he apparently overlooked the fact that the Australian race of *garzetta* does not have yellow feet—just a slight yellowing under the toes. J. N. HOBBS

SMALL ADVERTISEMENTS

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Principal Contents

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PLATE 49. Turnstone (*Arenaria interpres*) by carcass of Wolf (*Canis lupus*), Canada, May 1955 (the white pelage of the arctic Wolf can be seen behind). This was one of several Turnstones which fed freely on bird and mammal carcasses, pecking vigorously at the fatty portions and, when [illegible] where it was soft (pages 241-243) (*photo: D. Muir*)

British Birds

Vol. 55 No. 7

JULY 1962

Feeding behaviour of the Turnstone in arctic Canada

By S. D. MacDonald and David F. Parmelee

(Plate 49)

THIS SHORT PAPER has been written in response to the editorial comments following the interesting observations by D. G. Bell and Bernard King on "Turnstones feeding on bread" (*Brit. Birds*, 54: 325-326).

In 1955 we spent six months on northern Ellesmere Island, North-west Territories, conducting field studies to obtain information for the National Museum of Canada on the breeding cycles of birds in the far north. The principal area of investigation was Fosheim Peninsula, two thousand square miles of mountains and tundra plain to the north of the 79th parallel. Base camp was the joint Canadian-U.S. Weather Station of Eureka (80°00'N, 85°56'W). During the season we recorded 33 species of birds, and obtained nesting data on all except three of these. One of the species studied in detail was the Turnstone (*Arenaria interpres*).

Turnstones arrived in the area at the very end of May, when much of the country was still covered with snow. They did not go directly to their breeding grounds inland, but remained for a few days near the beaches, on adjacent slopes and by stream beds where the ground was free of snow. Even in such inhospitable surroundings they seemed remarkably well adapted to survive. At the end of May they still apparently had good reserves of body fat. Four of five specimens collected during the first days of arrival had been feeding on seeds; the other had not fed. They quickly discovered the patches of corn meal, rolled oats and cracked wheat which we put out to attract Snow Buntings (*Plectrophenax nivalis*). This fare was extremely popular;

The northern part of the archipelago of arctic Canada, showing the position of Fosheim Peninsula. The Turnstone (*Arenaria interpres*) is known to breed as far north as Alert and Cape Sheridan (*outline based on maps by the National Geographical Society, Washington*)

the Turnstones arrived in flocks of twenty to thirty at a time and devoured it more voraciously than did the Snow Buntings, which were usually crowded out. Some took advantage of table scraps and prepared dog food given to husky dogs. This food source was frequently shared amicably with Long-tailed Skuas (*Stercorarius longicaudus*).

The most aberrant feeding behaviour was observed when we put out the carcass of an arctic Wolf (*Canis lupus*). This was to attract Glaucous Gulls (*Larus hyperboreus*) to a trap area for ringing, but the first to arrive at the bait were Turnstones (plate 49). They pecked vigorously at fatty portions and, when the gulls and skuas had made holes in the muscle tissue, fed actively at places where the flesh was soft. They also ate freely from the carcasses of birds taken for museum specimens, including those of their own kind.

Other animal material was available to the Turnstones at this time. Fine sand or silt covered the upper slopes of many of the low hills and when it dried it formed thin, plate-like crusts up to ten inches in diameter. The larvae of insects (e.g. geometrid moths) were overwintering immediately below the crusts which the Turnstones therefore readily overturned. They were apparently somewhat selective in doing this, however, and bare slopes worked by a flock of feeding birds had a definite patchy appearance. In one place only one or two would be turned, while in others an area of several square feet would be moved. While flipping the pieces they worked with great dexterity and concentration, even in very stormy weather. On 31st May, at a temperature of 18.1° F, a small group was watched busily working on a windswept slope, apparently oblivious to the gusts of wind which sent the flakes of mud flying and at times obscured them from view with blowing snow. With binoculars we could see that they were inserting their bills in the cracks between the plates and quickly overturning them with deft thrusts under the edges. If an insect was found, it was seized as quickly as if it were active prey located under a stone on the beach.

In conclusion, we now can say that, in addition to its normal food, the Turnstone is known to feed upon bread, seeds, ground cereal grain, tinned dog food, table scraps and raw meat. These feeding habits are interesting in that they illustrate the ability of the species to recognise as edible many varied types of food which can supplement, or even replace for a time, its normal fare. This ability is of limited importance to survival, however, since supplies of such exotic foods are very localised in the Arctic. The point of greatest significance is, therefore, the turning of the dry plates of mud to obtain overwintering insects. This behaviour probably has a high level of survival value since it produces, even in low temperatures, a readily available source of food for which there is no competition from other species.

[In addition to the above, we have received several more notes on Turnstones taking food put out for them or discarded by humans. The localities concerned are Lerwick, Shetland (L. Gray); St. Kilda (Dr. D. Boddington, Capt. W. E. Waters); Seahouses and Monks'

House, Northumberland (D. L. Arnold, M. C. W. Evans, Dr. P. R. Evans); Morecambe and Lytham St. Annes, Lancashire (J. A. G. Barnes, N. Harwood *per* K. G. Spencer); Swansea, Glamorgan (M. P. Harris); and Marazion, Cornwall (B. King); and attention has been drawn to published references to this habit on Sule Skerry (L. J. Rintoul and E. V. Baxter, *The Birds of Scotland*, 1953) and to the success of oatmeal as a bait for trapping Turnstones at Monks' House (E. A. R. Ennion, *The House by the Shore*, 1960). The actual sites where feeding has taken place have included sand, shingle, grassland, a pier and various metalled surfaces from streets to a promenade. The records go back as far as 1954 and the majority refer to the six months from October to March (especially January), though in one or two cases it is stated that the season has no significance.

The eating of bread or crumbs is mentioned in each case, with the addition of cheese in Shetland and Cornwall, crab meat or fish remains in Northumberland and Glamorgan, and household scraps in general on St. Kilda and at Seahouses where potato peel and apple-core have been particularly noted. Both pearl barley and oatmeal are successful as baits for trapping Turnstones at Monks' House—as many as eleven having been caught and ringed there together—and bread has similarly been used on St. Kilda.

Nearly everywhere the tameness of the birds is commented upon. For example, for the past five years or more they have often been seen feeding on the roadway by Seahouses Harbour, quickly flying up to join Starlings (*Sturnus vulgaris*) and House Sparrows (*Passer domesticus*) when scraps are thrown out from the adjoining houses; while at Lerwick, although not actually taking food from the hand, they come as near as 18 inches to anyone feeding them. Turnstones are also recorded as feeding on these unnatural foods alongside an Oystercatcher (*Haematopus ostralegus*) and occasional Rock Pipits (*Anthus spinoletta*) in Shetland, Herring Gulls (*Larus argentatus*), Blackbirds (*Turdus merula*) and Snow Buntings (*Plectrophenax nivalis*) on St. Kilda, and Black-headed Gulls (*Larus ridibundus*) at Swansea. On St. Kilda the Turnstones benefit directly from the Starlings and Herring Gulls which scatter scraps from the food refuse bins outside the army kitchen. L. Gray makes the point, however, that Turnstones do not require other species to lead them to such food; at Lerwick, indeed, they can be seen waiting outside for it before it is really daylight and they are on the spot as soon as the food is put out. Similarly, on several occasions when bread was put out in hard weather on St. Kilda, W. E. Waters noted that a Turnstone would give its whistling *keeoo-keeoo* call from a four-foot drystone wall; this call attracted the other Turnstones and within half a minute the whole flock of twenty birds would be feeding only a few feet from him.—EDS.]

An ornithological sketch of the Barycz valley in Poland

By A. Mrugasiewicz and J. Witkowski

Zoological Institute, University of Wroclaw

(Plates 50-57)

INTRODUCTION

THE BARYCZ VALLEY, in western Poland, has long been famous for its birds. It is one of the few places in central Europe where such rare species as White-tailed Eagle, Lesser Spotted Eagle, Kite, Grey Lag Goose, Crane, Black Stork, Purple Heron* and others are concentrated in a relatively small area, and, equally important, it forms a reserve of major importance for nesting and passage duck of many kinds. The Barycz, a tributary of the Oder in the northern part of Lower Silesia, is a small lowland river, some 100 miles (162 km.) long; its fall is insignificant, amounting to no more than 12.5 inches per mile (22 cm. per km.) in its middle and lower reaches. It has many tributaries, rills and rivulets in a large fluvo-glacial valley. The valley itself is bounded by the Trzebnickie hills on the south, while in the north it passes gradually into the Wielkopolsko-Kujawska plain. It is widest, up to 16 miles (25 km.), in the Milicz district. In the glacial period a great river flowed here in front of a thawing glacier.

Since the beginning of the 14th century, the area has been noted as a centre for the large-scale production of Carp (*Cyprinus carpio*). The flat, gently sloping terrain enabled large areas to be covered with artificial ponds at small cost for the breeding of fish. In the Middle Ages, this was carried on by monks, mainly Cistercians, and by the middle of the 17th century the total area of the ponds had reached 120,863 acres (8,443 hectares), but later a number were drained and converted into agricultural land, the mud providing a fertile sediment some 16 inches (40 cm.) thick. The present area of the fish ponds is 116,113 acres (6,521 hectares) and the production of Carp in recent years has varied between 1,237 and 1,386 tons (between 1,258 and 1,408 metric tons). Since the war, a valuable series of national parks and nature reserves has been built up in Poland, and a considerable area in the Barycz valley has been designated as a bird reserve (the "Wood-and-Pond" Reserve), with shooting under rigorous control. This has led to the nesting of a number of rare species, in some cases after an interval of many years, and increases in the breeding populations of

*Scientific names are all given in Appendices A and B on pages 268-272, as well as in the tables.

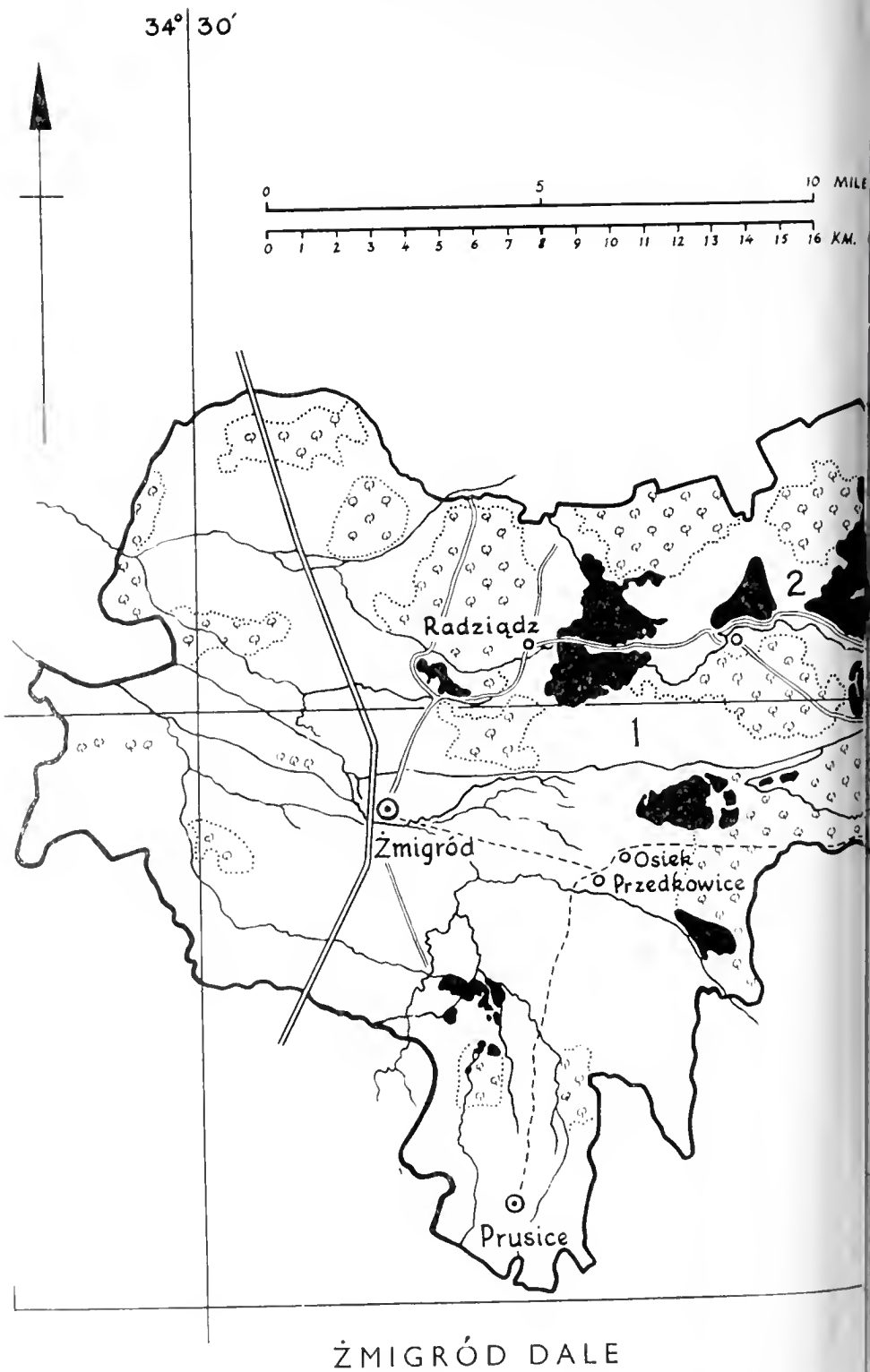
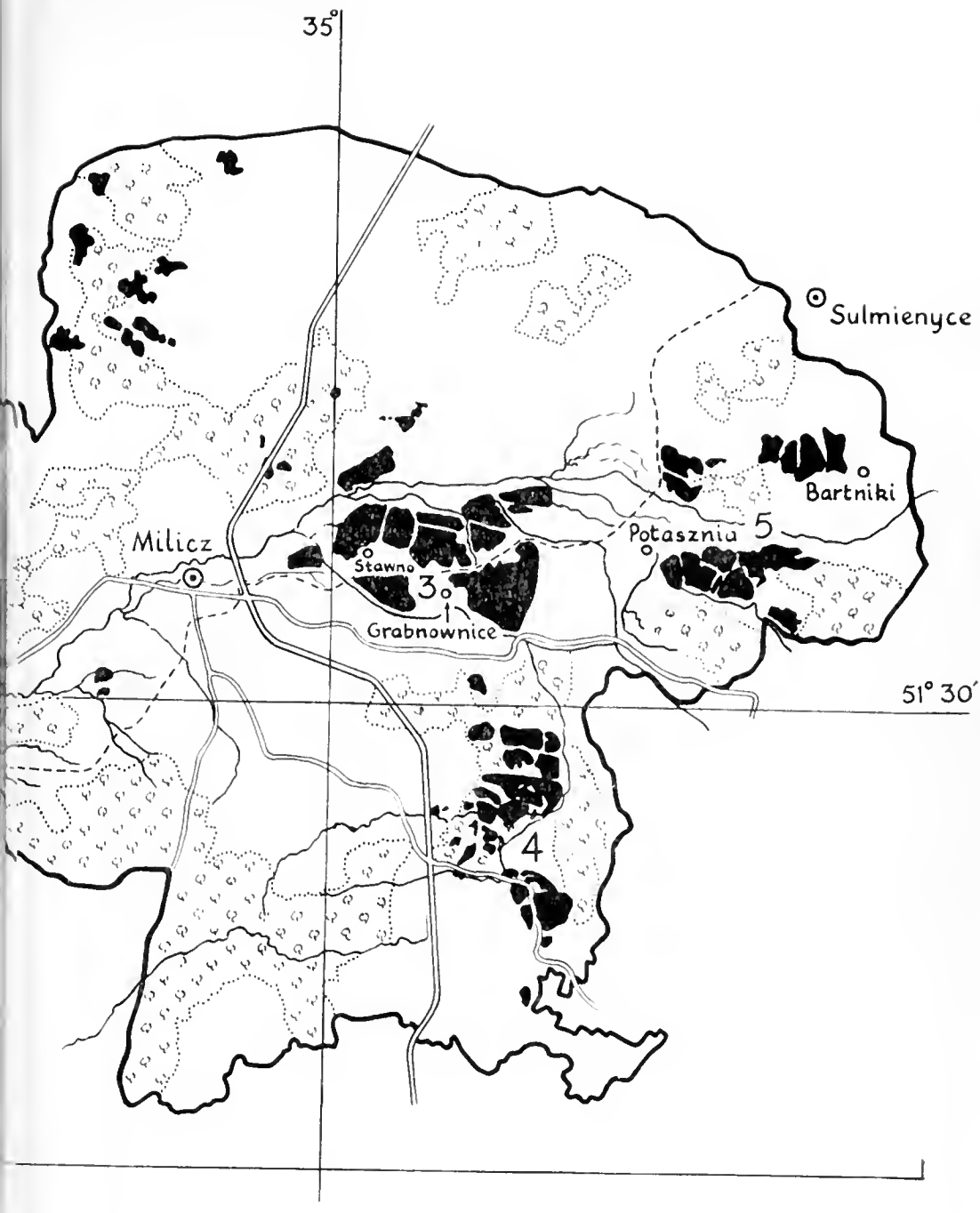


FIG. 1. Map of the Barycz valley, Poland, the boundaries coinciding with those of the former administrative district of Milicz and the groups of ponds being indicated by numbers: 1 Radziądz, 2 Ruda Sulowska, 3 Milicz, 4 Krośnice and 5 Potasznia (see page 249) (*drawn by Robert Gillmor from a sketch by the authors*)



MILICZ DALE

boundary of area

rivers, canals, etc.

ponds

woods

narrow-gauge railway

main roads

other important roads

others, despite the fact that this fertile valley has a not inconsiderable human population.

The area has long been of interest to ornithologists, both Polish and German. It was first "discovered" ornithologically and described by Floericke (1891). Among pre-war observers, three deserve particular mention, F. Pampel, F. Pax and A. Schlott. Pampel (1922) listed as many as 172 species of birds in the Barycz valley. After the war, Szarski (1950) was the first to publish a list of the region; it included 130 species, of which 118 were breeding. In our own observations during the years 1954-61 we have identified 215 species; of these, 161 have nested and five others probably do so.

DESCRIPTION OF THE TERRAIN

The area covered by our investigations consists mainly of ponds, woods and meadows in the district of Milicz, situated in a region which was formerly inundated and traversed by numerous arms of the river. The present woods are remnants of a vast swampy forest which surrounded the Barycz some centuries ago. The river now flows in a single bed; the former river arms and inundated land have in the course of centuries been transformed into the ponds where the Carp breed, and the swampy areas have been drained and turned to woods and meadows. The common feature of the three types of habitat is that they are interconnected by the former river beds. Most of these are now dry, but they are still quite conspicuous.

The area covered by our study is a strip of land varying in width from about six to sixteen miles (10-25 km.) situated on both sides of the Barycz between two towns, Żmigród in the west and Bartniki in the east (Fig. 1). The reserve occupies 60% of the strip. This tract of land, however transformed by man, has always been a favourite nesting haunt of many birds, especially aquatic species, and during migration periods it serves as an inland oasis for migrants which can rest and feed there.

In this section of the Barycz valley there are two smaller valleys where large groups of ponds are concentrated—the valley of Milicz, approximately 330-360 feet above sea level, in the east, and the valley of Żmigród in the west. In the vicinity of Sułów these two valleys are separated by a ridge 426 feet (130 m.) above sea level, the main valley narrowing here to a mile (about 1.6 km.).

The largest group of ponds is found in the Milicz valley. The environments are of two kinds. In the Żmigród valley, and also in the southern part of the Milicz valley, the ponds are enclosed by extensive swampy meadows and deciduous woods, while in the remaining part of the Milicz valley they are surrounded by dry meadows and fields. Accordingly, there are certain differences in the bird popu-

lation, the most outstanding being that on the ponds situated within woods. These have fewer geese and grebes, but some Passerines and bird of prey occur in large numbers. Moreover, a more marked species differentiation of the bird population can be seen there.

Ponds

The ponds are concentrated in four big groups which correspond to the administrative divisions of the fishing farms: (a) Radziądz in the west and south-west of the Milicz district; (b) Ruda Sułowska in the central part; (c) Milicz and Potasznia in the north-east; and (d) Krośnice in the south-east (Fig. 1). Most of them are drained each autumn so that the Carp may be caught and they are filled again between February and April. In each of the four groups, however, there are some ponds stocked with fry; these are filled with water all the year round.

The sizes of the ponds vary greatly from no more than a dozen acres to several hundred acres or even larger. The largest pond in the Radziądz group, "Stary" ("The Old One"), has an area of about 11,040 acres (420 hectares). However, they are not deep. The most shallow, those in which fry are kept, are only twenty inches (some 50 cm.); and, though parts of the so-called "productive" ponds may be as much as seventy inches (about 180 cm.), they also have many shallow places where the water is barely more than 15 inches (about 40 cm.). In such places there is luxuriant water vegetation. All ponds have a net of bed ditches as well as fisheries, i.e. places where fish resort when the ponds are being drained; the fisheries reach a depth of 10-13 feet (about 3-4 m.).

The ponds may be divided into two distinct categories. In the first (Fig. 2a), the emergent hydrophytes are markedly differentiated. The section adjoining the water's edge consists of woods, deciduous or mixed; these pass into thickets of alder (*Alnus*) and osier (*Salix*), and then, as the water becomes deeper, there are sedges (*Carex*) and reeds (*Phragmites communis*). In addition, there are islets of reed scattered all over the water surface and along the bed trenches. In the second category (Fig. 2b) the emergent hydrophytes, chiefly reeds, make up about 50% of the whole area. These form an edge zone, which is mainly narrow though its tongues may reach far into the pond, and there are also reed islets of varying size. On some ponds of this type are found marshy meadows which extend from the banks into the water, gradually passing into sedges growing in tufts and then into the zone of reeds. Ponds of this kind make up two-thirds of the Milicz water area.

Apart from these two types, one can distinguish sections of ponds which owe their origin to the building up of new, higher dykes and

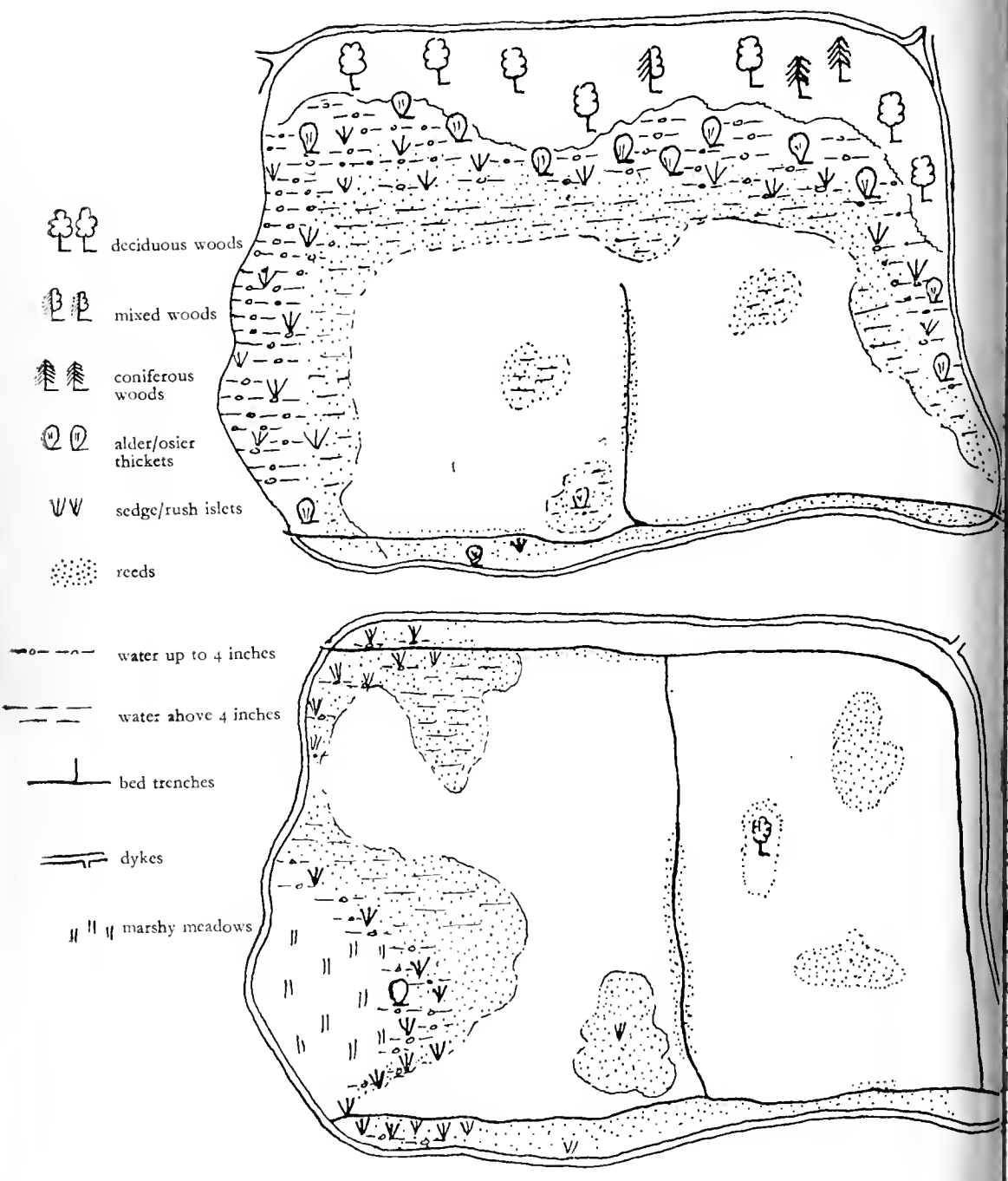


FIG. 2. Diagrammatic sketches of the two main types of ponds in the Barycz valley, Poland. In the first (a), there are deciduous and mixed woods adjoining the water's edge; these pass into thickets of alder and osier and thence into sedges and reeds. In the second (b), the water plants make up half the whole area, with tongues reaching into the pond and reed islets of varying size; there are often also marshy meadows extending from the banks into the water, gradually passing into sedges and then the edge zone of reeds. For a fuller explanation see page 249

the consequent rise in the water level. In this way some areas of woodland, chiefly alder, were flooded and the trees died out in places where the water was deep. Thus a new kind or, more precisely, a distinct section of the pond has resulted, in which flooded wood has been substituted for the edge zone of reeds. A typical example of flooded wood is the northern part of the pond "Jeleni III" in Radziądz. Sometimes islands raised above the water surface are found in the ponds. These are covered mainly by alders; birches (*Betula*), aspen (*Populus tremula*) and oaks (*Quercus*) grow in drier places; sedges, rushes (*Juncus*) and, in higher places, brambles (*Rubus*) form the thicket. The edges of the ponds, as well as the dykes, abound in deciduous trees, and not infrequently in hazels (*Corylus avellana*), brambles, and so on. Oaks, including some several hundred years old, prevail on the old dykes, while alders, birches, willows (*Salix*) and oaks grow on those which have been in existence less than a hundred years.

*Meadows**

The largest area of meadows is found in the Żmigród valley, both along the river Barycz and by its numerous small tributaries, and also in the east along the right bank of the Barycz between Milicz and Bartniki. Considerable portions of the meadows are flooded in March by the rise of the water in the Barycz, which turns them for a short time into areas of shallow water.

*Woods**

Marshy and damp woods are situated in the Żmigród valley between the meadows and ponds in the vicinity of the Barycz, and also in the southern part of the Milicz valley. These are predominantly deciduous woods, often of a "moor-wood" type (see page 255). Their present high water level is due to the ruin of the drainage system during the war and the years immediately after. Though in recent years proper control of the water system has been resumed, such woods are hardly accessible in spring (especially from February to April). The total area of these marshy woods is about 5,000 acres (some 2,000 hectares). In the Milicz valley there are mainly dry forests situated predominantly on the right bank of the Barycz.

BIRD POPULATIONS OF PARTICULAR HABITATS

Each habitat has its characteristic bird population and these are discussed separately below.

Avifauna of the ponds

The edge zones of reed and sedge, as well as the fringes of the reed

*A more detailed discussion of meadows and woody habitats is found on pages 254-258.

islets which are scattered all over the open water, are breeding sites of Coots and Great Reed and Reed Warblers. These three species make up about 90% of the bird population of these parts of the ponds. The edges of reed islets are also frequently used for nesting by Grey Lag Geese (plate 54b), while the interiors are inhabited by Marsh Harriers and Bitterns and more rarely by Grey Lag Geese, Ferruginous Ducks and Pochards. If the reeds are sparse and there are tufts of sedge among them because the water is rather shallow (below ten inches), then such species as Pochard, Ferruginous Duck (plate 51a) and Water Rail are predominant.

The narrow stretches of reeds along the bed trenches are favourite dwelling-places of Great Reed Warblers as well as of Reed Warblers. Where the bottom of the pond practically reaches the water surface, or even emerges from it, one finds all the three diving ducks that nest in the Barycz valley, i.e. Pochard, Ferruginous and Tufted. At times they breed so close together that eggs of different species are found in the same nest. We once found three nests, two of Tufted and one of Pochard, in an area not larger than five square yards. Nests of the Grey Lag Goose and Mallard may also occur in these places.

Shallower areas covered with tufts of compact sedge also provide homes for the three diving ducks, and Sedge Warblers and Reed Buntings are common there. The colonies of Black-headed Gulls and Black-necked Grebes are usually in this habitat. It is worth noting that in the Barycz valley the Black-necked Grebe always nests with Black-headed Gulls (plate 53a). The Great Crested Grebe breeds on small reed-enclosed stretches of water; the Red-necked Grebe (plate 51b), on the other hand, prefers places where sedges pass into reed thicket or give way to open water.

In flooded woods the Mallard is predominant, breeding inside rotten tree trunks or in tufts of sedge growing under the trees. As many as 193 nests of this species were discovered in 130 acres (about 60 hectares) of flooded woodland. Such areas are also nesting-sites of Grey Lag Geese (plate 53b), Pochards, Ferruginous Ducks, Little Grebes and Coots, the last building in dry osier bushes. Nests of the Penduline Tit (plate 54a) are found on the branches of dying alders. Dying trees also attract such hole-nesting and cavity-nesting birds as Great Spotted Woodpeckers, Lesser Spotted Woodpeckers and Spotted Flycatchers.

Reeds growing in deeper water are cut down early in May. The cut reeds drift to form floating rafts along the shores or the edges of islets, and these are favourite nesting-sites for Black-headed Gulls, Black-necked Grebes and Common Terns.

A distribution of the various nesting species found on the ponds is shown in Table 1.

B breeding in very large numbers or in colonies
b breeding in large numbers
b breeding regularly but sparsely

	Edge zone and sedge	Islets of re	Marshy m into standi	Sedge tuffi	Reed and	Flooded d forest	Vegetation	Islands wi growing in	Dykes	Cut reed
Great Crested Grebe (*Podiceps cristatus*)	–	*b*	–	–	*b*	*b*	–	–	–	–
Red-necked Grebe (*Podiceps griseigena*)	–	–	–	*b*	*b*	*b*	–	–	–	–
Black-necked Grebe (*Podiceps nigricollis*)	–	–	–	B	B	–	–	–	–	B
Little Grebe (*Podiceps ruficollis*)	*b*	–	–	*b*	–	*b*	–	–	–	*b*
Bittern (*Botaurus stellaris*)	–	*b*	–	–	–	*b*	–	–	–	–
Mallard (*Anas platyrhynchos*)	–	–	*b*	*b*	–	B	*b*	b	*b*	–
Tufted Duck (*Aythya fuligula*)	–	*b*	–	*b*	–	–	b	–	–	–
Pochard (*Aythya ferina*)	–	*b*	–	b	–	b	b	–	–	–
Ferruginous Duck (*Aythya nyroca*)	*b*	*b*	–	*b*	–	*b*	b	–	–	–
Grey Lag Goose (*Anser anser*)	–	*b*	–	–	–	*b*	*b*	*b*	–	–
Marsh Harrier (*Circus aeruginosus*)	–	*b*	–	–	–	–	–	–	–	–
Water Rail (*Rallus aquaticus*)	*b*	*b*	*b*	–	–	*b*	–	–	–	–
Spotted Crake (*Porzana porzana*)	*b*	–	–	–	–	–	–	–	–	–
Moorhen (*Gallinula chloropus*)	*b*	–	–	–	–	–	–	–	–	–
Coot (*Fulica atra*)	b	b	–	–	*b*	*b*	b	–	–	–
Black-headed Gull (*Larus ridibundus*)	–	–	–	B	B	–	–	–	–	B
Common Tern (*Sterna hirundo*)	–	–	–	–	–	–	–	–	–	*b*
Cuckoo (*Cuculus canorus*)	*b*	–	–	–	–	–	–	*b*	*b*	–
Great Spotted Woodpecker (*Dendrocopos major*)	–	–	–	–	–	*b*	–	–	*b*	–
Lesser Spotted Woodpecker (*Dendrocopos minor*)	–	–	–	–	–	*b*	–	–	–	–
Hooded Crow (*Corvus corone cornix*)	–	–	–	–	–	b	–	*b*	*b*	–
Penduline Tit (*Remiz pendulinus*)	–	–	–	–	–	*b*	–	*b*	*b*	–
Savi's Warbler (*Locustella luscinioides*)	*b*	*b*	–	–	–	–	–	–	–	–
Great Reed Warbler (*Acrocephalus arundinaceus*)	B	*b*	–	–	–	–	b	–	–	–
Reed Warbler (*Acrocephalus scirpaceus*)	b	*b*	–	–	–	–	b	–	–	–
Sedge Warbler (*Acrocephalus schoenobaenus*)	*b*	–	*b*	–	–	–	–	–	–	–
Spotted Flycatcher (*Muscicapa striata*)	–	–	–	–	–	b	–	–	*b*	–
Chaffinch (*Fringilla coelebs*)	–	–	–	–	–	b	–	*b*	*b*	–
Yellowhammer (*Emberiza citrinella*)	–	–	–	–	–	–	–	*b*	b	–
Reed Bunting (*Emberiza schoeniclus*)	*b*	–	b	*b*	–	–	–	–	*b*	–

Avifauna of meadows

The meadows of the Barycz valley may be divided into dry, damp and marshy, according to the water-level. We can also distinguish meadows enclosed in woods from those situated in the open, i.e. among fields and ponds.

The bird population of any meadow largely depends on its water-supply: the damper the meadow, the richer its avifauna, as is shown in Table 2.

Table 2—Distribution of nesting species in meadows in the Barycz valley, Poland, grouped according to degree of wetness

b breeding regularly in large numbers *b* breeding regularly but sparsely (*b*) breeding in only a few places

	Meadows out in the open			Meadows enclosed by woods		
	dry	damp	marshy	dry	damp	marshy
Garganey (*Anas querquedula*)	–	*b*	*b*	–	–	*b*
Lapwing (*Vanellus vanellus*)	*b*	b	b	–	–	–
Snipe (*Gallinago gallinago*)	–	–	*b*	–	–	*b*
Curlew (*Numenius arquata*)	(*b*)	(*b*)	–	–	–	–
Black-tailed Godwit (*Limosa limosa*)	–	*b*	*b*	–	–	–
Redshank (*Tringa totanus*)	–	–	*b*	–	–	–
Skylark (*Alauda arvensis*)	*b*	–	–	–	–	–
Whinchat (*Saxicola rubetra*)	b	*b*	–	*b*	*b*	–
Grasshopper Warbler (*Locustella naevia*)	–	b	*b*	–	b	–
Sedge Warbler (*Acrocephalus schoenobaenus*)	–	–	b	–	–	*b*
Meadow Pipit (*Anthus pratensis*)	*b*	*b*	b	*b*	*b*	*b*
Blue-headed Wagtail (*Motacilla flava*)	*b*	*b*	–	–	–	–
Corn Bunting (*Emberiza calandra*)	*b*	*b*	–	–	–	–
Reed Bunting (*Emberiza schoeniclus*)	–	–	b	–	–	–

Avifauna of woods

The woods of the Barycz valley differ from the typical woods of the Polish plains only in that they are situated in the vicinity of water and marshland, but for this reason they attract such rare birds as Black Kites, White-tailed Eagles, Black Storks (plate 50b) and Cranes (plate 50a). The relative water-supply of these woods is the most important factor in the constitution of their avifauna and we may divide them into the dry and the damp. The age and species of the trees are a second important factor. The following are reckoned as dry woods and occur in the higher, sandy areas:

(1) Pine (*Pinus silvestris*) woods; these are of uniform age and consist of trees some 30 years old. Undergrowth is lacking; the forest floor is covered with bilberry (*Vaccinium myrtillus*) and heather (*Calluna*), less frequently by small shrubs.

(2) Coniferous coppices, i.e. young woods of a single species of conifer from six to 30 years old.

(3) Clearings, glades and wood-edges; these areas are dominated by a dense and high grass, patches of raspberry and bramble (*Rubus*), young birches (*Betula*) and so on, or by young (less than five years old) copses planted in clearings and sandy wastes.

Damp, marshy or swampy woods are found in the lower-lying areas where the soil is richer, i.e. in the ancient basin of the Barycz and its tributaries. It is rather difficult to isolate any clear-cut habitats in these woods, since one type gradually passes into another. So we shall limit our discussion to a general description of certain habitats and their most typical characteristics. In this way we hope to avoid intricate subdivision into smaller woody areas which do not distinctly differ from one another in so far as the birds are concerned. Among major habitats one should include:

(1) Large areas of beech (*Fagus silvatica*) woods covering the Trzebnica Hills; south of Milicz and in the Żmigród valley they reach as far as the Barycz valley. Ancient beeches over a hundred years old, with pines interspersed in places, dominate these woods. As a rule there is no undergrowth, and sparse grass and some herbaceous vegetation form the forest floor.

(2) Multi-species deciduous and mixed woods in marshy places dotted with small ponds which rarely dry up even by the end of the summer. In this type of wood there is great variety in the age and species of trees. Besides oaks and pines some eighty years old there are birch, alder, beech, ash (*Fraxinus excelsior*), fir (*Picea excelsa*) and others. The same species also form the undergrowth and so the tier of tree-crowns ranges from the highest tops down to about seven feet (two metres) above the ground. The vegetation of the forest floor is generally very poor: there are few herbaceous plants and the grass is abundant only in places which are fairly well lighted. Such woods have a very diversified avifauna.

(3) Alder (*Alnus*) woods grow in patches in the lowest and therefore wettest parts. Usually these are the ancient river basins lying near the present bed of the Barycz. If the wood borders on the meadows, then a typical "moor-wood" often results. This is a wood of alders with an undergrowth of sedge, and the trees may occur singly or in groups on islets emerging out of the water. The very existence of the undergrowth and the constitution of the forest floor vegetation depend on the height of the water level and the extent to which it falls during the spring and summer. The extreme cases involve two kinds of the alder wood. In the first, the water stays practically all

Table 3—Ecological distribution of nesting species in woods in the Barycz valley, Poland

b breeding regularly in large numbers
b breeding regularly but sparsely
(*b*) breeding in only a few places

	Pine woods	Coniferous coppices	Clearings, glades, edges of woods, in dry areas	Beech woods	Multi-species deciduous and mixed woods	Permanently flooded alder woods	Seasonally flooded alder woods	Deciduous coppices, clearings, glades, edges of woods, in damp areas
Black Stork (*Ciconia nigra*)	(*b*)	–	–	(*b*)	(*b*)	–	–	–
Mallard (*Anas platyrhynchos*)	–	–	–	–	–	–	*b*	–
Buzzard (*Buteo buteo*)	*b*	–	*b*	*b*	*b*	–	b	*b*
Sparrowhawk (*Accipiter nisus*)	–	*b*	–	–	*b*	–	–	*b*
Goshawk (*Accipiter gentilis*)	*b*	–	–	–	*b*	–	*b*	–
Black Kite (*Milvus migrans*)	–	–	–	–	(*b*)	–	–	(*b*)
Honey Buzzard (*Pernis apivorus*)	–	–	–	–	(*b*)	–	–	(*b*)
Woodcock (*Scolopax rusticola*)	–	–	–	–	*b*	–	*b*	–
Stock Dove (*Columba oenas*)	*b*	–	–	b	*b*	–	–	–
Woodpigeon (*Columba palumbus*)	–	–	*b*	–	*b*	–	–	*b*
Turtle Dove (*Streptopelia turtur*)	–	–	*b*	–	–	–	*b*	*b*
Cuckoo (*Cuculus canorus*)	–	*b*	b	*b*	*b*	*b*	b	b
Tawny Owl (*Strix aluco*)	–	–	–	*b*	*b*	–	–	*b*
Nightjar (*Caprimulgus europaeus*)	*b*	–	–	–	–	–	–	*b*
Roller (*Coracias garrulus*)	–	–	*b*	–	–	–	–	*b*
Green Woodpecker (*Picus viridis*)	–	–	–	–	–	–	–	*b*
Great Spotted Woodpecker (*Dendrocopos major*)	b	–	*b*	*b*	b	b	b	b
Lesser Spotted Woodpecker (*Dendrocopos minor*)	–	–	–	*b*	*b*	*b*	*b*	–
Middle Spotted Woodpecker (*Dendrocopos medius*)	–	–	–	–	*b*	*b*	*b*	–
Black Woodpecker (*Dryocopus martius*)	*b*	–	–	*b*	*b*	–	–	–
Wryneck (*Jynx torquilla*)	*b*	–	b	–	–	–	–	*b*
Woodlark (*Lullula arborea*)	*b*	*b*	*b*	–	–	–	–	–
Golden Oriole (*Oriolus oriolus*)	–	–	–	–	*b*	–	*b*	*b*

Great Tit (*Parus major*)	*b*	–	–	*b*	b	*b*	*b*	b
Blue Tit (*Parus caeruleus*)	–	–	*b*	–	b	–	–	b
Coal Tit (*Parus ater*)	*b*	*b*	–	–	–	–	–	–
Crested Tit (*Parus cristatus*)	*b*	–	–	–	–	–	–	–
Marsh Tit (*Parus palustris*)	*b*	*b*	*b*	–	*b*	–	*b*	*b*
Long-tailed Tit (*Aegithalos caudatus*)	–	*b*	*b*	–	–	–	–	*b*
Nuthatch (*Sitta europaea*)	*b*	–	–	*b*	*b*	–	*b*	*b*
Treecreeper (*Certhia familiaris*)	–	–	–	*b*	*b*	*b*	*b*	*b*
Short-toed Treecreeper (*Certhia brachydactyla*)	–	–	–	–	*b*	*b*	–	*b*
Wren (*Troglodytes troglodytes*)	–	*b*	*b*	*b*	*b*	b	b	*b*
Mistle Thrush (*Turdus viscivorus*)	*b*	*b*	*b*	–	–	–	–	*b*
Song Thrush (*Turdus philomelos*)	*b*	*b*	*b*	*b*	b	–	b	b
Blackbird (*Turdus merula*)	–	*b*	*b*	*b*	*b*	–	b	*b*
Whinchat (*Saxicola rubetra*)	–	–	*b*	–	–	–	–	*b*
Robin (*Erithacus rubecula*)	–	*b*	–	*b*	b	–	b	b
River Warbler (*Locustella fluviatilis*)	–	–	–	–	–	*b*	b	–
Icterine Warbler (*Hippolais icterina*)	–	–	*b*	–	–	–	–	b
Blackcap (*Sylvia atricapilla*)	–	*b*	*b*	–	*b*	–	*b*	b
Whitethroat (*Sylvia communis*)	–	–	*b*	–	–	–	–	b
Willow Warbler (*Phylloscopus trochilus*)	–	–	*b*	*b*	*b*	–	–	b
Chiffchaff (*Phylloscopus collybita*)	*b*	b	*b*	*b*	b	b	b	b
Wood Warbler (*Phylloscopus sibilatrix*)	–	–	–	b	*b*	–	–	*b*
Golderest (*Regulus regulus*)	–	*b*	–	–	–	–	–	–
Spotted Flycatcher (*Muscicapa striata*)	–	–	*b*	*b*	b	*b*	*b*	b
Pied Flycatcher (*Muscicapa hypoleuca*)	*b*	–	–	*b*	b	–	–	*b*
Red-breasted Flycatcher (*Muscicapa parva*)	–	–	–	(*b*)	–	–	–	–
Tree Pipit (*Anthus trivialis*)	b	*b*	b	*b*	–	–	–	b
Red-backed Shrike (*Lanius cristatus collurio*)	–	–	*b*	–	–	–	–	b
Starling (*Sturnus vulgaris*)	*b*	–	*b*	*b*	b	*b*	*b*	b
Hawfinch (*Coccothraustes coccothraustes*)	–	–	–	–	*b*	–	*b*	*b*
Chaffinch (*Fringilla coelebs*)	*b*	*b*	*b*	*b*	b	*b*	b	b
Yellowhammer (*Emberiza citrinella*)	*b*	–	*b*	–	–	–	–	b
Tree Sparrow (*Passer montanus*)	–	–	*b*	*b*	*b*	*b*	*b*	*b*

year round, the maximum depth in spring being about two feet (60 cm.); there is no undergrowth and clusters of sedges form the forest floor. In the second, the water stays less than six months (spring and early summer) and is under a foot (30 cm.) in depth; the undergrowth consists of thick bird cherry (*Padus avium*) and shrubs, and in places which are better lighted there are whole fields of sedges, nettles (*Urtica*), grass, iris (*Iris*) and so on.

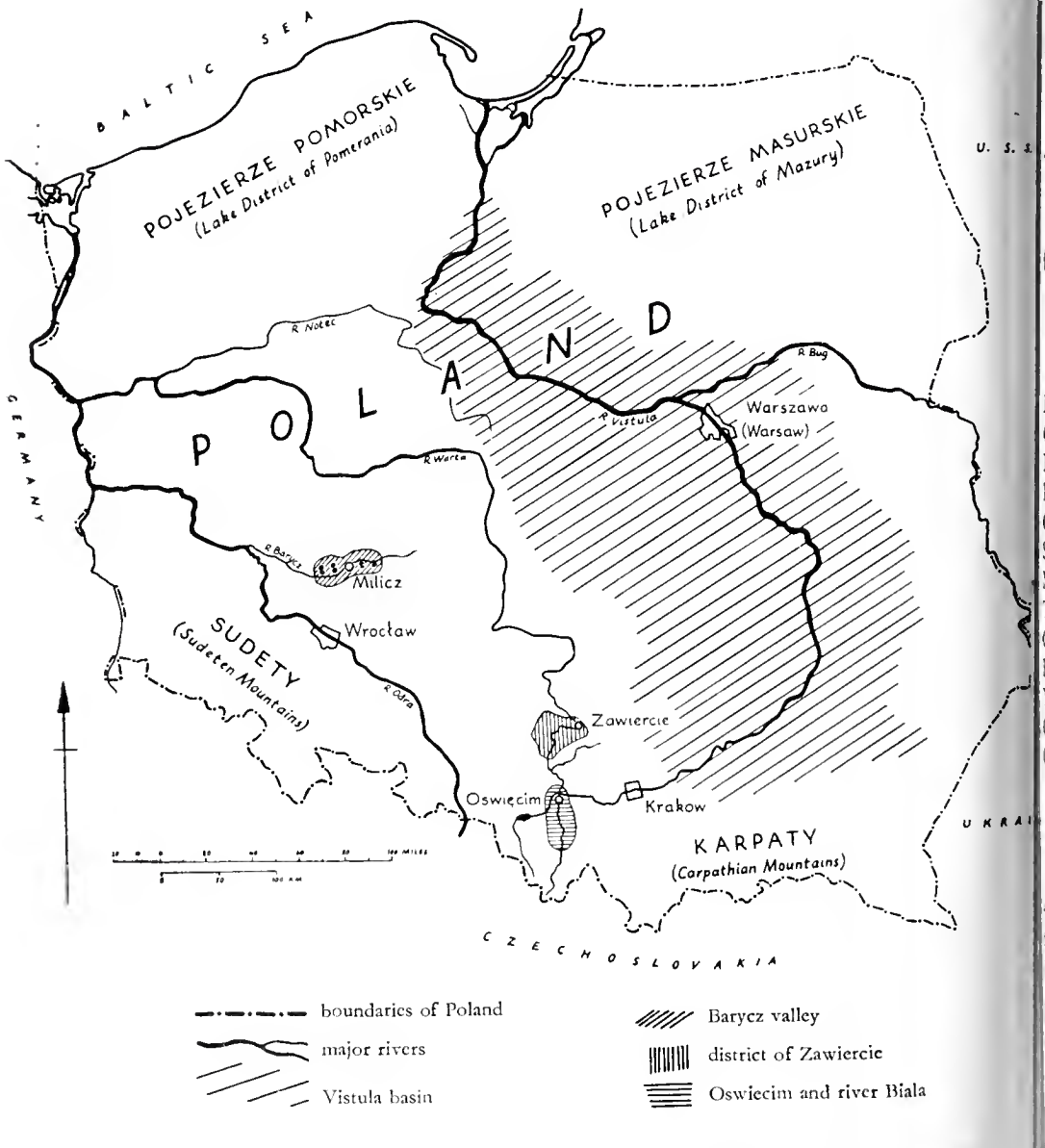


FIG. 3. Map of Poland, showing the Barycz valley, the lake districts of Pomerania and Mazury, the Vistula basin, the district of Zawiercie, and Oświęcim and the river Biala (see page 259) (*drawn by Robert Gillmor from a sketch by the authors*)

(4) Deciduous coppices, clearings, glades and wood-edges. These are all well lighted areas dotted with trees of various species and less than thirty years old, as well as shrubs and high grass.

Table 3 shows the distribution of various nesting species in different woodland environments.

Avifauna of fields, fallows and pastures

To complete the picture of the bird population of the Barycz valley, a word or two must be said on such habitats as cultivated land (i.e. fields, pastures and fallow) and wastes even though the avifauna differs little from that of the corresponding types of environment elsewhere. The breeding birds of these habitats are shown in Table 4.

Table 4—Breeding birds of cultivated and waste land in the Barycz valley, Poland

b breeding regularly in large numbers *b* breeding regularly but sparsely
(*b*) breeding locally in considerable numbers, in holes in trees by roads and fields

	Fields	Pastures	Fallows and wastes
Partridge (*Perdix perdix*)	*b*	–	*b*
Quail (*Coturnix coturnix*)	*b*	–	–
Roller (*Coracias garrulus*)	(*b*)	(*b*)	–
Hoopoe (*Upupa epops*)	–	(*b*)	(*b*)
Crested Lark (*Galerida cristata*)	–	–	*b*
Skylark (*Alauda arvensis*)	b	*b*	*b*
Magpie (*Pica pica*)	*b*	–	–
Tawny Pipit (*Anthus campestris*)	*b*	*b*	*b*
Great Grey Shrike (*Lanius excubitor*)	*b*	–	–
Red-backed Shrike (*Lanius cristatus collurio*)	*b*	b	*b*
Yellowhammer (*Emberiza citrinella*)	b	*b*	*b*
Corn Bunting (*Emberiza calandra*)	*b*	–	–
Ortolan Bunting (*Emberiza hortulana*)	*b*	–	–

BREEDING BIRDS OF THE BARYCZ VALLEY, 1954-61

Appendix A shows the nesting birds of the Barycz valley in comparison with those of the Polish lowland excluding the lake districts of Pomerania and Mazury (Sokołowski 1958), the Vistula basin (Domaniewski 1918), the district of Zawiercie (Masłowski 1938), and Oświęcim and the river Biała (Godyń 1935).

The breeding avifauna of the Barycz valley compares favourably with that of the Polish lowland and the Vistula basin, considering the respective sizes of each (Fig. 3). The areas of the Polish lowland and Vistula basin are respectively more than 150 times and 90 times larger than that of the Barycz valley. Clearly they represent a greater variety

of habitats; yet the differences in numbers of nesting species are not so considerable as might have been expected. The Polish lowland exceeds the Barycz valley by 44, and the Vistula basin by only 36. The other two regions, the district of Zawiercie and the area of Oświęcim and the river Biala, are much poorer in breeding species even though they are almost as large as the Barycz valley and abound in rivers, fishing ponds, woods and marshy meadows. Zawiercie has 45 fewer breeding species and Oświęcim-Biala 30 fewer. This appears to be largely due to these areas having (1) smaller ponds, with completely different emergent hydrophytes, (2) fewer damp woods and (3) a higher density of human population. The comparison is still more favourable to the Barycz valley when only those species which are closely connected with a water environment are considered. In the Barycz valley 60 aquatic species nest, while the corresponding figures for other regions are Polish lowland 78, Vistula 69, Zawiercie 30, and Oświęcim-Biała 37.

The Barycz valley is rich not only in species but also in numbers. Some water birds breed there more numerously than anywhere else in Poland. Table 5 gives the total of nests, for each of the species most typical of the Milicz ponds, found during a census of the pond "Jeleni III" in Radziądz, between March and the end of July. This pond has an area of about 420 acres (169 hectares); 160 acres (about 65 hectares) are made up of an extremely varied vegetation of emergent hydrophytes.

NOTES ON SPECIES OF PARTICULAR INTEREST

Purple Heron. This species did not breed in Silesia from the mid-nineteenth century until 1956, when two nests with young birds were discovered near Radziądz (Łukasizewicz 1957). Since then both adults and young have been seen every year. This is the only known breeding place in Poland.

White Stork. The Barycz valley has the highest concentration of this species in Silesia. The White Stork is known to have been able to adapt itself to man's management of natural resources since earliest times, but there have been some fluctuations in numbers this century. Thus, in 1907, when a reduction had become apparent, a census revealed 153 pairs in the Milicz district. After this, the species became scarcer and scarcer every year, the same phenomenon being observed in Silesia and central Europe in general. A census in 1922 showed that the total in the Barycz valley had fallen to 49 pairs. Numbers then remained more or less stable until a slow but steady increase began to be noted after 1945. By 1959 some 130 pairs were nesting in the Milicz district, though the number fell to 80 in 1960. In the Barycz valley over 90% of nests are built on houses.

PLATE 5 (A). Crane (*Megalornis grus*) at nest, Poland. The Barycz valley is one of the few places in central Europe where this and such other local birds as the White-tailed Eagle, Kite, Grey Lag Goose and Black Stork (see below) still nest. The Crane breeds in the marshes near to the woods (page 254)

PLATE 5 (B). Black Stork (*Ciconia nigra*) and young, Poland. Being near water and marsh, the Barycz woods attract this rare species and it is actually increasing there. Old oaks are the traditional breeding places, but it now nests in pine woods miles from any marsh (page 262) *photos: W. Poźlajkow*

PLATE 53A. On
nest of Black-necke
Grebe (*Podiceps nigr
collis*) and two
Black-headed Gu
(*Larus ridibundus*)
which often bree
together (page 25

PLATE 53B. Gr
Lag Goose (*Ans
anser*) on nest
flooded alder woo
one of the typic
sites for this comm
bird of the Barv
(*photo: J. Witkows*

LATE 54A. Penduline
it (*Remiz pendulinus*) and
urtly built nest, Poland.
the Barycz valley this
rd nests in young copses
alder and birch or in
d flooded alder woods.
is a spreading species
hich has colonised the
ea since 1950 (page 264)

PLATE 54B. Grey Lag Goose (*Anser anser*) on nest among reeds, Poland. The Barycz valley has one of the highest concentrations of breeding Greylags in western and central Europe—some 300 pairs in all (page 262) —and reed beds are another regular nest site (*cf.* opposite) (*photos W. Pucbalski*)

PLATE 55. Above, Lesser Spotted Eagle (*Aquila pomarina*); below, Savi's Warbler (*Locustella luscinioides*) (*photos: Eric Hosking*). The former needs large areas of marshy meadow and primeval forest, and is decreasing in Poland (page 263), while the latter, a bird of sedge, has colonised the Barycz valley since 1949 (page 264)

LATE 56. Nest of Osprey (*Pandion haliaetus*) at the top of a pine in a mixed wood in the Ruda Sulowska group of ponds in 1959. It was not laid in and the last definite breeding in the Baryez valley was in the late nineteenth century, though young were observed with adults in 1949 and 1950 (page 264) (*photo: J. Wilkonski*)

Table 5—Numbers of nests found during a census of a typical pond area of 420 acres in the Barycz Valley, Poland, during March-July

	Edge zones of reed and sedge	Islets of reed	Islets of reed, rush and sedge	Marshy islands with alder, sedge and *Juncus*	Flooded alder woods	Vegetation in ditches	Total
Great Crested Grebe (*Podiceps cristatus*)	0	7	4	0	1	0	21
Red-necked Grebe (*Podiceps griseigena*)	0	0	4	2	2	0	8
Black-necked Grebe (*Podiceps nigricollis*)	0	0	152	0	0	0	152
Little Grebe (*Podiceps ruficollis*)	2	0	0	0	5	1	8
Tern (*Botaurus stellaris*)	0	1	0	0	0	0	1
Mallard (*Anas platyrhynchos*)	0	0	0	19	193	2	214
Teal (*Anas crecca*)	0	0	0	1	1	0	2
Garganey (*Anas querquedula*)	0	0	0	0	1	0	1
Gadwall (*Anas strepera*)	0	3	4	0	0	0	7
Pochard (*Aythya ferina*)	0	6	6	10	34	0	56
Ferruginous Duck (*Aythya nyroca*)	0	0	2	0	4	0	6
Mixed clutches of ducks	0	2	4	2	9	1	18
Grey Lag Goose (*Anser anser*)	0	16	0	0	11	4	31
Marsh Harrier (*Circus aeruginosus*)	0	2	0	0	1	0	3
Water Rail (*Rallus aquaticus*)	0	2	0	6	3	0	11
Coot (*Fulica atra*)	27	34	9	0	12	11	93
Black-headed Gull (*Larus ridibundus*)	0	0	87	*c.* 100	0	0	*c.* 187
Common Tern (*Sterna hirundo*)	0	0	4	0	0	0	4
Hoopoe (*Upupa epops*)	0	0	0	0	1	0	1
Great Spotted Woodpecker (*Dendrocopos major*)	0	0	0	0	2	0	2
Lesser Spotted Woodpecker (*Dendrocopos minor*)	0	0	0	0	1	0	1
Middle Spotted Woodpecker (*Dendrocopos medius*)	0	0	0	0	1	0	1
Golden Oriole (*Oriolus oriolus*)	0	0	0	0	2	0	2
Hooded Crow (*Corvus corone cornix*)	0	0	0	1	3	0	4
Magpie (*Pica pica*)	0	0	0	1	1	0	2
Great Tit (*Parus major*)	0	0	0	0	4	0	4
Blue Tit (*Parus caeruleus*)	0	0	0	0	2	0	2
Penduline Tit (*Remiz pendulinus*)	0	0	0	2	1	0	3
Blackbird (*Turdus merula*)	0	0	0	1	2	0	3
Great Reed Warbler (*Acrocephalus arundinaceus*)	23	39	0	0	0	12	74
Reed Warbler (*Acrocephalus scirpaceus*)	29	18	0	0	0	12	59
Sedge Warbler (*Acrocephalus schoenobaenus*)	7	0	0	6	4	0	17
Chaffinch (*Fringilla coelebs*)	0	0	0	0	8	0	8
Reed Bunting (*Emberiza schoeniclus*)	1	0	0	8	0	0	9

57 (*opposite*). Top, part of the largest pond of the Ruda Sulowska group Barycz valley; this illustrates both an edge zone of reeds (*Phragmites communis*) dry islands with pines (*Pinus*) and a luxuriant growth of grass. Centre, a Barycz pond in which the aquatic vegetation covers over 60% of the whole; foreground are tufts of sedge (*Carex*) mingled with reedmace (*Typha*) and water rt (*Oenanthe crocata*)—a breeding ground for Pochards and Ferruginous Bottom, part of a marshy island thickly covered with rushes (*Juncus ratus*), sedges and sparse alders (*Alnus*)—a mass nest site for Mallards and Rails (*photos: J. Witkowski*)

Black Stork (plate 50b). This shy bird once nested only in large marshy woods far from human habitation, but it is more common now. Twenty-five years ago there were only six nests in all Silesia, whereas in recent years 15 nests have been found in the Barycz valley alone (and five more pairs probably nest there, though the exact sites have not been discovered). Old widely branched oaks in marshy areas seldom frequented by man are the traditional breeding places, but some have now taken to building in dry pine woods with no undergrowth, even ones which are two miles (about 3 km.) or more from the marshes. This species may thus be adapting itself, at least in part, to man's economy. It is more and more difficult for the Black Stork to find its proper environment and, were it not adaptating to man-made conditions, it would disappear completely. The Barycz valley is by no means the only instance of this species' return to places long abandoned. Neither is this phenomenon peculiar to Black Stork alone; many large birds whose numbers were once shrinking have now increased and recolonised (e.g. Heron, Purple Heron, Mute Swan, Kite, Black Kite, White-tailed Eagle and Crane).

Grey Lag Goose (plate 54b). The Barycz valley has probably the highest concentration of nests of this species in Poland, if not in the whole of central and western Europe. This relatively small area is the home of some 300 pairs. Up to the 1930's the population was even larger; between 300 and 400 pairs then nested in a flooded alder wood near Niezgoda and some 25-30 pairs in the ponds near Milicz. Now the water-level in the alder wood is over three feet (about one metre) lower than it used to be and vegetation has grown up to cover practically all the water surface. At present the geese make their nests on the large ponds which are the earliest flooded. These are distributed uniformly over the whole group of lakes. It is worth adding that the autumn passage of geese seems to be different now from what it used to be. All observers up to a decade ago, including Szarski (1950), reported large flocks of Grey Lag Goose in the autumn, but in recent years, especially in 1959, only a few small flocks numbering 12-30 individuals of this species have been seen. All the large flocks of geese on autumn migration have consisted of Bean Geese alone. We cannot account for this and it is hard to believe that observers of such high standing as Pax and Szarski could have been mistaken in identifying these two species.

Mute Swan. In the 1880's the Barycz valley was the last breeding place of this bird in Silesia and for the next sixty years there was no nesting at all. The first record of its reappearance on the ponds near Milicz dates back to 1948 (Szarski 1950). From that time a pair has bred there each year, and another pair nested on the Sułów pond in 1958 and 1960. In April and May every year the ponds of the Barycz

valley also attract several pairs on passage. The Mute Swan nests in considerable numbers in North Poland and it has continued to increase in recent years.

Lesser Spotted Eagle (plate 55a). Large areas of marshy meadows and primeval forests are essential for this species. Few such places remain in Silesia, and hardly any in the Barycz valley. As a result, the western border of its range is gradually shifting eastwards. Since 1956 there has been only one nesting pair in the area, in the Żmigród valley. As the bird is easily scared and the woods are intensely exploited, the nest-site changes every year. It is not unlikely, therefore, that the Lesser Spotted Eagle will abandon the Barycz valley as a breeding area in the near future.

Kite. This species ceased to nest in Silesia at the turn of the century, and in the Barycz valley even earlier. For the next fifty years only individuals on passage were seen, and in the five years from 1955 there was only one record, but in 1960 we found a nest in a large wood in the Żmigród valley.

Black Kite. This is one of the commonest birds of prey on the ponds, second only to the Marsh Harrier. There are some 15 pairs nesting all over the Barycz valley in the vicinity of ponds. The species is common in Poland in general, especially by the inland waters of the lake district.

White-tailed Eagle. This species nested in Silesia before 1851. Later observations, by no means infrequent, referred to young vagrants or odd adults and there was no evidence of breeding for the next hundred years. Recently, however, it has begun to nest again in the Barycz valley. From numerous observations of adults and young in the breeding season we may infer that its return dates from about 1950, but no nest was actually found until 1955 when one was located in an alder wood, flooded practically all the year round, in the Żmigród valley. Two other nests of the same pair have been found, one in a tall beech and the other in an old pine, both in dry areas. In the eastern section of this region some adults were watched in the summer of 1959; a newly-made nest was found, but breeding did not take place. From October till April, when the ponds are mostly drained, the White-tailed Eagle is a common bird of prey. Chiefly young birds are noted, though adults are not rare. The largest number (up to eleven) was recorded in Radziądz on 6th December 1959. This species nests in northern districts of Poland; it is most numerous in the Szczecin gulf.

Honey Buzzard. This bird is quite difficult to detect and so deemed rarer than it really is. At any rate, it is not scarce in the Barycz valley and at least 10-15 pairs nest there. They usually keep to dry areas, close to meadows, fields, wastes, clearings, glades and so on; such places abound in the bees (Apidae) which constitute their

main food. The nests are built in damper parts, though always near to open areas.

Osprey. The last definite record of breeding in the Barycz valley was in the late nineteenth century. In recent times, however, Szarski (1949, 1950) watched adults with young at the ponds near Sułów and in 1959 a pair built a nest in the same region but did not breed (plate 56). During migration periods (April, August-October) the Osprey is quite common on passage. It nests regularly in Poland in the lake districts of Pomerania and Mazury.

Peregrine. Only one pair of this species is known to breed in the Barycz valley, though the area abounds in water birds which Peregrines like to hunt; the nest is in a large wood south of Milicz, some distance from the lakes. Two or three other Peregrines have been seen in the breeding season, hunting in the valley, but they probably nest in the woods adjoining the area. In autumn and early spring individuals on passage are seen not infrequently, usually preying on ducks or Starlings. There does not appear to have been any major change in the numbers in the Barycz valley, and in Silesia as a whole, for some scores of years.

Penduline Tit (plate 54a). There was no evidence of nesting in the Milicz district up to 1950; all the old records refer to occasional occurrences. It was not until 1951 that W. Puchalski found a nest in Radziądz, but since then this species has been noted in ever increasing numbers. In 1959 as many as 49 nests were discovered by the ponds (25 in Radziądz, four in Ruda Sułowska, 14 in Milicz and six in Potaszznia). This confirms the recent extension of the Penduline Tit's range northwards and eastwards, which has been combined with a gradual increase in the areas recently colonised.

Redwing. This species breeds mainly in northern Europe and Asia. In Poland there have been occasional records of nesting in the Carpathian and Tatry mountains. There were no reports of breeding in the lowlands until our discovery of a nest with eggs near Milicz in May 1954.

Stonechat. Until recently this species had been observed only by Floericke (1890), but Ferens (1948) mentioned its occurrence and we have found it twice during the breeding season in the fields in the vicinity of Gątkowice, so it may possibly be nesting.

Bluethroat. Formerly this beautiful bird was not uncommon, not only in the Barycz valley but throughout Silesia, but recent observations point to an alarming reduction. It is still a nesting bird of the Barycz valley, but we have seen it only a few times during our six years of observation in this region.

Savi's Warbler (plate 55b). Apart from one reference (Floericke 1890) to a male being killed, there were no reports of this species until 1949. Recently, however, it has been found at several places on the

ponds of Radziądz, Milicz and Potasznia; in 1961 a nest was found and 17 singing males were counted at the first two groups of ponds. Savi's Warbler is not uncommon in eastern and central Poland; only in the west is it held to be rare and recently it has been observed in several places in Germany, which, with our observations, suggests that it is now extending its range westwards.

Aquatic Warbler. Floericke (1890) gave this species as a breeding bird of the Barycz, but Pax (1925) rejected the evidence. Otherwise there is no other past information. We have seen it four times in recent years, in July, August and October, but there has been no evidence of breeding.

Red-breasted Flycatcher. Formerly deemed very rare, this attractive little bird was not reported in the area after 1945 until a single breeding area was recently found in old deciduous forest, mixed with pines, near Radziądz. As the species lives in the crowns of large and shady deciduous trees, it is easily overlooked, but in 1961 no less than 18 separate parties of newly fledged young were discovered.

Grey Wagtail. This species is usually considered typical of mountain regions. Recently, however, it has been increasing its range more and more and extending into the plains. Pax (1925) mentioned it as a breeding bird of the Barycz valley. Our observations have established its presence in April and May, but we have no proof of nesting.

SPECIES FORMERLY NESTING IN THE BARYCZ VALLEY

Cormorant. There was a colony near Żmigród in the 1870's, but not after that time. In 1919 a single pair nested on the ponds near Milicz. Since then there has been no evidence of breeding in the Barycz valley and the species occurs only on passage. On the other hand, it still nests in North Poland in large numbers, particularly in the lake district of Mazury and West Pomerania; indeed, the population in those parts has considerably expanded in recent years.

Short-toed Eagle. The last reliable evidence of breeding was in 1918, in the neighbourhood of Sulôw. Since that time there has been no record, even of accidental occurrence. The species rarely nests in Poland and then only in the east.

Black Grouse. This species was completely exterminated in the Barycz valley thirty years ago, though it is still common in eastern parts of Poland.

CONCLUSION

When the results of our observations are compared with the data given by Szarski (1950), one cannot miss the changes, and very favourable ones, too, that have taken place in the last ten years. These changes

have largely resulted from the restriction of shooting in the breeding season and from the considerable extension of marshy and flooded areas caused by the destruction of the drainage system during the war. These two factors are responsible for the reappearance in the Barycz valley of such species as the White-tailed Eagle, Osprey, Mute Swan and Purple Heron, which are now nesting there after a prolonged absence, in some cases of as much as a hundred years. White-tailed Eagles are, indeed, becoming more and more numerous every year. Any resumption of an efficient water economy might be dangerous to the Black Stork, but it seems to be beginning to adapt itself to man's management of nature and we may hope its numbers will be kept steady. A similar situation exists for such waders as the Ruff and Black-tailed Godwit; like the Black Stork, they have again found suitable habitats since 1950. The Redwing and the Penduline Tit, on the other hand, are newcomers to the Barycz valley. Both species have found their way there as a result of recent extensions of range, the Redwing southwards and the Penduline Tit northwards and westwards. The latter is becoming more and more common although it reached the Barycz valley only in 1950. During this time of gain, only three species seem to have been lost from the area.

It is worth remembering that the Barycz valley is by no means primitive, even though it has been sheltering many species which are extremely shy and very easily scared. Large areas of water and old woods, so attractive for the bird population, are the outcome of an age old economy which transformed the primitive scenery and yet maintained its peculiar character. Without constant control by man, the ponds would soon turn into swamps and quagmires. The creation of the reserve in the Barycz valley has offered brighter prospects for this area: if the regulations aiming at the preservation of nature are properly observed, we may reasonably expect that the Barycz valley will retain, if not enlarge, its present bird population.

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Appendix A—Breeding birds of the Barycz valley during 1945-61, compared with those of certain other areas of Poland

b breeding *p* present in summer but breeding not proved
? formerly bred but probably does so no longer

	Barycz valley	Polish lowland	Vistula basin	Zawiercie district	Oświęcim and Biala river
Black-throated Diver (*Gavia arctica*)	–	b	b	–	–
Great Crested Grebe (*Podiceps cristatus*)	b	b	b	b	b
Red-necked Grebe (*Podiceps griseigena*)	b	b	b	–	–
Black-necked Grebe (*Podiceps nigricollis*)	b	b	b	b	b
Little Grebe (*Podiceps ruficollis*)	b	b	b	b	b
Cormorant (*Phalacrocorax carbo*)	–	b	–	–	–
Heron (*Ardea cinerea*)	b	b	b	–	–
Purple Heron (*Ardea purpurea*)	b	*p*	–	–	–
Night Heron (*Nycticorax nycticorax*)	–	b	*p*	–	–
Little Bittern (*Ixobrychus minutus*)	b	b	b	b	b
Bittern (*Botaurus stellaris*)	b	b	b	*p*	b
White Stork (*Ciconia ciconia*)	b	b	b	b	b
Black Stork (*Ciconia nigra*)	b	b	b	*p*	–
Mallard (*Anas platyrhynchos*)	b	b	b	b	b
Teal (*Anas crecca*)	b	b	b	b	b
Garganey (*Anas querquedula*)	b	b	b	b	b
Gadwall (*Anas strepera*)	b	b	b	–	–
Wigeon (*Anas penelope*)	–	b	–	–	–
Pintail (*Anas acuta*)	b	b	b	–	–
Shoveler (*Spatula clypeata*)	b	b	b	–	–
Red-crested Pochard (*Netta rufina*)	–	b	–	–	–
Tufted Duck (*Aythya fuligula*)	b	b	–	–	–
Pochard (*Aythya ferina*)	b	b	b	–	b
Ferruginous Duck (*Aythya nyroca*)	b	b	b	–	–
Goldeneye (*Bucephala clangula*)	–	b	b	–	–
Red-breasted Merganser (*Mergus serrator*)	–	b	b	–	–
Goosander (*Mergus merganser*)	–	b	b	–	–
Grey Lag Goose (*Anser anser*)	b	b	–	–	–
Mute Swan (*Cygnus olor*)	b	b	b	–	–
Spotted Eagle (*Aquila clanga*)	–	b	b	–	–
Lesser Spotted Eagle (*Aquila pomarina*)	b	b	b	–	–
Booted Eagle (*Hieraëtus pennatus*)	–	*p*	?	–	–
Buzzard (*Buteo buteo*)	b	b	b	b	b
Sparrowhawk (*Accipiter nisus*)	b	b	b	b	b
Goshawk (*Accipiter gentilis*)	b	b	b	b	b
Kite (*Milvus milvus*)	b	b	b	–	b
Black Kite (*Milvus migrans*)	b	b	b	b	b
White-tailed Eagle (*Haliaëtus albicilla*)	b	b	b	–	–
Honey Buzzard (*Pernis apivorus*)	b	b	b	b	–
Marsh Harrier (*Circus aeruginosus*)	b	b	b	–	–
Hen Harrier (*Circus cyaneus*)	*p*	b	b	–	–

Montagu's Harrier (*Circus pygargus*)	–	b	b	–	–
Short-toed Eagle (*Circaëtus gallicus*)	–	b	b	–	–
Osprey (*Pandion haliaëtus*)	b	b	b	–	–
Hobby (*Falco subbuteo*)	b	b	b	b	b
Peregrine (*Falco peregrinus*)	b	b	b	–	–
Saker (*Falco cherrug*)	–	*p*	?	–	–
Red-footed Falcon (*Falco vespertinus*)	–	b	–	–	–
Lesser Kestrel (*Falco naumanni*)	–	b	b	–	–
Kestrel (*Falco tinnunculus*)	b	b	b	b	b
Black Grouse (*Lyrurus tetrix*)	–	b	b	b	b
Capercaillie (*Tetrao urogallus*)	–	b	b	–	b
Hazel Hen (*Tetrastes bonasia*)	–	b	b	–	b
Partridge (*Perdix perdix*)	b	b	b	b	b
Quail (*Coturnix coturnix*)	b	b	b	b	b
Pheasant (*Phasianus colchicus*)	b	b	–	–	–
Crane (*Megalornis grus*)	b	b	b	–	–
Water Rail (*Rallus aquaticus*)	b	b	b	b	b
Spotted Crake (*Porzana porzana*)	b	b	b	b	b
Little Crake (*Porzana parva*)	b	b	b	–	*p*
Corncrake (*Crex crex*)	b	b	b	b	b
Moorhen (*Gallinula chloropus*)	b	b	b	b	b
Coot (*Fulica atra*)	b	b	b	b	b
Great Bustard (*Otis tarda*)	–	b	b	–	–
Lapwing (*Vanellus vanellus*)	b	b	b	b	b
Ringed Plover (*Charadrius hiaticula*)	–	b	b	–	–
Little Ringed Plover (*Charadrius dubius*)	b	b	b	b	b
Golden Plover (*Charadrius apricarius*)	–	*p*	?	–	–
Snipe (*Gallinago gallinago*)	b	b	b	b	b
Great Snipe (*Gallinago media*)	–	b	b	–	–
Woodcock (*Scolopax rusticola*)	b	b	b	b	*p*
Curlew (*Numenius arquata*)	b	b	b	–	–
Black-tailed Godwit (*Limosa limosa*)	b	b	b	–	–
Green Sandpiper (*Tringa ochropus*)	b	b	b	b	–
Wood Sandpiper (*Tringa glareola*)	*p*	b	b	–	–
Common Sandpiper (*Tringa hypoleucos*)	b	b	b	*p*	b
Redshank (*Tringa totanus*)	b	b	b	b	–
Ruff (*Philomachus pugnax*)	b	b	b	b	b
Stone Curlew (*Burhinus oedicnemus*)	–	b	b	b	–
Common Gull (*Larus canus*)	–	b	–	–	–
Little Gull (*Larus minutus*)	–	b	–	–	–
Black-headed Gull (*Larus ridibundus*)	b	b	b	–	b
Black Tern (*Chlidonias niger*)	b	b	b	–	b
White-winged Black Tern (*Chlidonias leucopterus*)	–	b	b	–	–
Common Tern (*Sterna hirundo*)	b	b	b	–	–
Little Tern (*Sterna albifrons*)	–	b	b	–	b
Stock Dove (*Columba oenas*)	b	b	b	b	b
Woodpigeon (*Columba palumbus*)	b	b	b	b	b
Turtle Dove (*Streptopelia turtur*)	b	b	b	b	b
Collared Dove (*Streptopelia decaocto*)	b	b	b	b	b
Cuckoo (*Cuculus canorus*)	b	b	b	b	b
Barn Owl (*Tyto alba*)	b	b	b	*p*	–
Scops Owl (*Otus scops*)	–	b	b	–	–
Eagle Owl (*Bubo bubo*)	–	b	b	–	–
Pygmy Owl (*Glaucidium passerinum*)	–	b	b	–	–

Little Owl (*Athene noctua*)	b	b	b	b	b
Tawny Owl (*Strix aluco*)	b	b	b	b	b
Ural Owl (*Strix uralensis*)	–	b	b	–	–
Long-eared Owl (*Asio otus*)	b	b	b	b	b
Short-eared Owl (*Asio flammeus*)	*p*	b	b	–	b
Tengmalm's Owl (*Aegolius funereus*)	–	b	b	–	–
Nightjar (*Caprimulgus europaeus*)	b	b	b	b	b
Swift (*Apus apus*)	b	b	b	b	b
Kingfisher (*Alcedo atthis*)	b	b	b	b	b
Roller (*Coracias garrulus*)	b	b	b	–	–
Hoopoe (*Upupa epops*)	b	b	b	b	b
Green Woodpecker (*Picus viridis*)	b	b	b	b	b
Grey-headed Woodpecker (*Picus canus*)	b	b	b	–	b
Great Spotted Woodpecker (*Dendrocopos major*)	b	b	b	b	b
White-backed Woodpecker (*Dendrocopos leucotos*)	–	b	b	–	–
Lesser Spotted Woodpecker (*Dendrocopos minor*)	b	b	b	b	–
Middle Spotted Woodpecker (*Dendrocopos medius*)	b	b	b	–	b
Black Woodpecker (*Dryocopus martius*)	b	b	b	b	b
Wryneck (*Jynx torquilla*)	b	b	b	b	b
Crested Lark (*Galerida cristata*)	b	b	b	b	b
Woodlark (*Lullula arborea*)	b	b	b	b	b
Skylark (*Alauda arvensis*)	b	b	b	b	b
Swallow (*Hirundo rustica*)	b	b	b	b	b
House Martin (*Delichon urbica*)	b	b	b	b	b
Sand Martin (*Riparia riparia*)	b	b	b	–	b
Golden Oriole (*Oriolus oriolus*)	b	b	b	b	b
Raven (*Corvus corax*)	–	b	b	–	–
Hooded Crow (*Corvus corone cornix*)	b	b	b	b	b
Rook (*Corvus frugilegus*)	b	b	b	b	b
Jackdaw (*Corvus monedula*)	b	b	b.	b	b
Magpie (*Pica pica*)	b	b	b	b	b
Jay (*Garrulus glandarius*)	b	b	b	b	b
Great Tit (*Parus major*)	b	b	b	b	b
Blue Tit (*Parus caeruleus*)	b	b	b	b	b
Coal Tit (*Parus ater*)	b	b	b	b	b
Crested Tit (*Parus cristatus*)	b	b	b	b	b
Marsh Tit (*Parus palustris*)	b	b	b	b	b
Willow Tit (*Parus atricapillus*)	b	b	b	b	b
Long-tailed Tit (*Aegithalos caudatus*)	b	b	b	–	b
Penduline Tit (*Remiz pendulinus*)	b	b	b	–	b
Bearded Tit (*Panurus biarmicus*)	–	b	–	–	–
Nuthatch (*Sitta europaea*)	b	b	b	b	b
Treecreeper (*Certhia familiaris*)	b	b	b	b	b
Short-toed Treecreeper (*Certhia brachydactyla*)	b	b	b	–	–
Wren (*Troglodytes troglodytes*)	b	b	b	b	b
Mistle Thrush (*Turdus viscivorus*)	b	b	b	b	b
Fieldfare (*Turdus pilaris*)	b	b	b	b	b
Song Thrush (*Turdus philomelos*)	b	b	b	b	b
Redwing (*Turdus iliacus*)	b	–*	–	–	*p*
Blackbird (*Turdus merula*)	b	b	b	b	b
Wheatear (*Oenanthe oenanthe*)	b	b	b	b	b
Stonechat (*Saxicola torquata*)	b	b	b	–	–
Whinchat (*Saxicola rubetra*)	b	b	b	–	*p*

*Some breeding records in recent years (Wolk 1960).

Redstart (*Phoenicurus phoenicurus*)	b	b	b	b	b
Black Redstart (*Phoenicurus ochruros*)	b	b	b	b	b
Nightingale (*Luscinia megarhynchos*)	b	b	b	b	b
Thrush Nightingale (*Luscinia luscinia*)	–	b	b	–	b
Bluethroat (*Luscinia svecica*)	b	b	b	–	b
Robin (*Erithacus rubecula*)	b	b	b	b	b
Grasshopper Warbler (*Locustella naevia*)	b	b	b	–	b
River Warbler (*Locustella fluviatilis*)	b	b	b	–	–
Savi's Warbler (*Locustella luscinioides*)	b	b	b	–	–
Great Reed Warbler (*Acrocephalus arundinaceus*)	b	b	b	b	b
Reed Warbler (*Acrocephalus scirpaceus*)	b	b	b	–	b
Marsh Warbler (*Acrocephalus palustris*)	b	b	b	b	b
Sedge Warbler (*Acrocephalus schoenobaenus*)	b	b	b	b	b
Aquatic Warbler (*Acrocephalus paludicola*)	*p*	b	b	b	–
Icterine Warbler (*Hippolais icterina*)	b	b	b	b	b
Blackcap (*Sylvia atricapilla*)	b	b	b	b	b
Barred Warbler (*Sylvia nisoria*)	b	b	b	b	b
Garden Warbler (*Sylvia borin*)	b	b	b	b	b
Whitethroat (*Sylvia communis*)	b	b	b	b	b
Lesser Whitethroat (*Sylvia curruca*)	b	b	b	b	b
Willow Warbler (*Phylloscopus trochilus*)	b	b	b	b	b
Greenish Warbler (*Phylloscopus trochiloides*)	–	b	–	–	–
Chiffchaff (*Phylloscopus collybita*)	b	b	b	b	b
Wood Warbler (*Phylloscopus sibilatrix*)	b	b	b	b	b
Goldcrest (*Regulus regulus*)	b	b	b	b	b
Firecrest (*Regulus ignicapillus*)	b	b	b	–	b
Spotted Flycatcher (*Muscicapa striata*)	b	b	b	b	b
Pied Flycatcher (*Muscicapa hypoleuca*)	b	b	b	–	*p*
Collared Flycatcher (*Muscicapa albicollis*)	–	b	b	–	b
Red-breasted Flycatcher (*Muscicapa parva*)	b	b	b	–	–
Dunnock (*Prunella modularis*)	b	b	b	b	–
Meadow Pipit (*Anthus pratensis*)	b	b	b	b	b
Tawny Pipit (*Anthus campestris*)	b	b	b	b	b
Tree Pipit (*Anthus trivialis*)	b	b	b	b	b
White Wagtail (*Motacilla alba*)	b	b	b	b	b
Grey Wagtail (*Motacilla cinerea*)	b	b	b	–	b
Blue-headed Wagtail (*Motacilla flava*)	b	b	b	b	b
Great Grey Shrike (*Lanius excubitor*)	b	b	b	b	b
Lesser Grey Shrike (*Lanius minor*)	–	b	b	–	–
Woodchat Shrike (*Lanius senator*)	b	b	b	–	–
Red-backed Shrike (*Lanius cristatus collurio*)	b	b	b	b	b
Starling (*Sturnus vulgaris*)	b	b	b	b	b
Hawfinch (*Coccothraustes coccothraustes*)	b	b	b	b	b
Greenfinch (*Chloris chloris*)	b	b	b	b	b
Goldfinch (*Carduelis carduelis*)	b	b	b	–	b
Siskin (*Carduelis spinus*)	b	b	b	b	b
Linnet (*Carduelis cannabina*)	b	b	b	b	b
Redpoll (*Carduelis flammea*)	–	–	?	?	–
Serin (*Serinus canarius*)	b	b	b	b	b
Bullfinch (*Pyrrhula pyrrhula*)	b	b	b	–	b
Scarlet Grosbeak (*Carpodacus erythrinus*)	–	b	b	–	–
Crossbill (*Loxia curvirostra*)	*p*	b	b	–	b
Parrot Crossbill (*Loxia pytyopsittacus*)	–	b	b	–	–
Chaffinch (*Fringilla coelebs*)	b	b	b	b	b

Yellowhammer (*Emberiza citrinella*)	b	b	b	b	b
Corn Bunting (*Emberiza calandra*)	b	b	b	b	b
Ortolan Bunting (*Emberiza hortulana*)	b	b	b	b	–
Reed Bunting (*Emberiza schoeniclus*)	b	b	b	b	b
House Sparrow (*Passer domesticus*)	b	b	b	b	b
Tree Sparrow (*Passer montanus*)	b	b	b	b	b

Appendix B—Non-breeding birds recorded in the Barycz valley during 1945-61

Regular passage-migrants

Black-throated Diver (*Gavia arctica*)
Cormorant (*Phalacrocorax carbo*)
Wigeon (*Anas penelope*)
Goldeneye (*Bucephala clangula*)
Goosander (*Mergus merganser*)
Smew (*Mergus albellus*)
White-fronted Goose (*Anser albifrons*)
Bean Goose (*Anser fabalis*)
Rough-legged Buzzard (*Buteo lagopus*)
Merlin (*Falco columbarius*)
Ringed Plover (*Charadrius hiaticula*)
Grey Plover (*Charadrius squatarola*)
Spotted Redshank (*Tringa erythropus*)
Greenshank (*Tringa nebularia*)
Little Stint (*Calidris minuta*)
Dunlin (*Calidris alpina*)
Common Gull (*Larus canus*)
Little Gull (*Larus minutus*)
Waxwing (*Bombycilla garrulus*)
Redpoll (*Carduelis flammea*)
Brambling (*Fringilla montifringilla*)

Irregular vagrants and accidentals (less than ten records)

Red-throated Diver (*Gavia stellata*)
Great White Heron (*Egretta alba*)
Night Heron (*Nycticorax nycticorax*)
Spoonbill (*Platalea leucorodia*)*
Scaup (*Aythya marila*)
Velvet Scoter (*Melanitta fusca*)
Red-breasted Merganser (*Mergus serrator*)
Shelduck (*Tadorna tadorna*)
Lesser White-fronted Goose (*Anser erythropus*)
Pink-footed Goose (*Anser brachyrhynchus*)
Whooper Swan (*Cygnus cygnus*)
Montagu's Harrier (*Circus pygargus*)
Golden Plover (*Charadrius apricarius*)
Great Snipe (*Gallinago media*)
Jack Snipe (*Lymnocryptes minimus*)
Temminck's Stint (*Calidris temminckii*)
Curlew Sandpiper (*Calidris testacea*)
Stone Curlew (*Burhinus oedicnemus*)
Herring Gull (*Larus argentatus*)
Kittiwake (*Rissa tridactyla*)
Little Tern (*Sterna albifrons*)
Raven (*Corvus corax*)
Nutcracker (*Nucifraga caryocatactes*)
Azure Tit (*Parus cyanus*)
Bearded Tit (*Panurus biarmicus*)
Water Pipit (*Anthus spinoletta*)
Twite (*Carduelis flavirostris*)
Snow Bunting (*Plectrophenax nivalis*)

*According to Szarski (1950).

Irish Golden Eagles and a link with Scotland

By C. Douglas Deane

(Plate 58)

IN THE LAST FIFTEEN YEARS there has been a noticeable spread of the Golden Eagle (*Aquila chrysaëtos*) in northern Britain (see, for example, Nicholson 1957). Among the likely factors are the wartime respite from persecution, which probably resulted in a "post-war bulge" of surplus immatures, and the major shift in agricultural emphasis from sheep-rearing to re-afforestation. Benington (1954) recorded the return of the Golden Eagle to Ireland and, though there

has been no reported increase beyond the one pair, an interesting fact about the food of these birds has come to light; this provides a link with Scotland which is presumably the reservoir from which Irish Golden Eagles are now drawn. This short paper therefore summarises the fortunes of the species in Ireland.

In the first half of the nineteenth century the Golden Eagle nested regularly in the higher mountains of Munster, Connaught and Ulster. There is evidence that it was permanently resident in thirteen counties. Clockwise from the south, these were Cos. Waterford, Tipperary, Kerry, Galway, Mayo, Sligo, Leitrim, Donegal, Fermanagh, Tyrone, Londonderry, Antrim and Down. The decline seems to have begun soon after the start of the nineteenth century and before the introduction of the breech-loading shotgun which ushered in the golden era of game-preservation. Trapping, shooting and poisoning by shepherds and gamekeepers were probably the main factors, with collectors helping to put the finishing touches when the species became rare.

The last breeding pair of Golden Eagles survived until 1910 or 1911 and the last non-breeding resident was a single bird which frequented the mountains between Armoy and Ballycastle in Co. Antrim from 1926 until 1930; in March 1929 two were seen in this area (though there was no evidence of breeding) and a fifth primary feather from one of these birds is in the Ulster Museum. The next twenty years produced only one record of a Golden Eagle in Ireland, near Glenveagh in Co. Donegal on 19th April 1947 (Kennedy, Ruttledge and Scroope 1954).

Then in April 1952 came reports of a large bird being seen over Rathlin Island and the sea cliffs of the adjacent mainland. On 14th May 1953 a primary feather from the right wing of an almost adult Golden Eagle was picked up in that part of north Antrim and it also is now in the Ulster Museum. Two months later, on 18th July 1953, Gordon Greeves, a farmer from Co. Down, found an eyrie and two young on an Antrim sea cliff, the first record of Golden Eagles breeding in that county for something like a century (Benington 1954). At this point the cliff rises to six hundred feet, of which nearly four hundred feet is talus; the face is bare of vegetation and faces north. The place is one where White-tailed Eagles (*Haliaëtus albicilla*) used to nest in the first half of the nineteenth century. Golden Eagles bred successfully every year from 1953 to 1960, using four different sites during those eight years. The first (1953, 1960) was a grass ledge about fifty feet from the top of the talus and 350 feet from the beach. The second (1954, 1956, 1957, 1958) was a fissure close to a knife-edge of cliff; this fissure was approximately six feet wide at the bottom end where the nest was built some fifty feet from the foot of the cliff, and it narrowed upwards for about forty feet. The third

(1955) was a small rock ledge, just large enough to hold the nest, about half way up the cliff. The fourth (1959) was a small point of rock about a hundred feet up the cliff. Though breeding was not proved in 1961, it should be added that three birds were seen by Nelson Bell over Ballintoy, Co. Antrim, about 19th August of that year.

The remains examined at the plucking sites showed that Rabbits (*Oryctolagus cuniculus*) and Blue Hares (*Lepus timidus*) were the principle victims of the Antrim eagles. I made a special study of the food material in the nest and was fascinated to find that the Blue Hares were of the short-legged, grey-blue Scottish race (*L. t. scoticus*) and not of the reddish-brown form native to Ireland (*L. t. hibernicus*). The Scottish Blue Hare was introduced into Northern Ireland on at least one occasion—at Black Braes, Co. Londonderry, in 1864 (Barrett-Hamilton 1898)—but it died out and there is no evidence that this subspecies exists in the country today. Presumably, therefore, these mammals must have been brought over the North Channel from Scotland, a remarkable feat when one realises that a Blue Hare weighs over half what an eagle does and the shortest crossing is the 13½ miles from the Mull of Kintyre to Torr Head. If this assumption is correct, as I think it must be, it is also a useful illustration of the distances which eagles will travel in search of food and it is interesting that they should thus return to the country from which they presumably came. Nobody has yet reported seeing one of these birds carrying a Blue Hare, but on several occasions one or other of the pair has been witnessed coming in from the direction of the open sea. There has been little other prey recorded, apart from Rabbits and Blue Hares, but the remains of a lamb was discovered on one occasion at a plucking site and remains of Herring Gulls (*Larus argentatus*) and Rock Doves (*Columba livia*), as well as feathers of Fulmars (*Fulmarus glacialis*), have been found. Once the male eagle was seen to sit on the body of a Fulmar dead on its nest.

In the last few years there have been reports of Golden Eagles in other areas of Ireland, notably Co. Donegal, but all have been unconfirmed. If the single pair continued to breed successfully, and if the link with Scotland is maintained, it is to be hoped that the species will eventually increase and spread once more beyond the northern coastal fringe.

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Notes

Water Rail killing Little Stint and Eel.—With reference to the recent notes on Water Rails (*Rallus aquaticus*) killing a Wren (*Troglodytes troglodytes*) and other small Passerines (*Brit. Birds,* 55: 132-133 and 165), I should like to record that on 4th September 1958, at Falsterbo, Sweden, I was watching a small party of twenty-four Little Stints (*Calidris minuta*) feeding at a drying and shallow pool when a Water Rail dashed out of some adjacent reeds and seized one. It pecked it and trampled it in the mud until it was dead. I recovered the body and found that part of the breast was missing, eaten or torn off.

The following morning, at the same pond, a Water Rail dashed out at a White Wagtail (*Motacilla alba*), but failed to catch it. Later, it or another appeared again and killed a small Eel (*Anguilla anguilla*) thirteen inches long without making any attempt to eat it. There were several Water Rails by this pond—and also half a dozen Spotted Crakes (*Porzana porzana*)—so that more than one bird may have been involved.

A. G. G. Thompson

Melanistic Black-headed Gulls in Northumberland.—In the late afternoon of 30th December 1961, an unusual small gull was seen in a flock leaving a roost on a coastal meadow near Seahouses, Northumberland. In the short time it was within binocular range, it showed a remarkable amount of black in its plumage. The following day, Miss P. A. Harrison and Miss M. B. Hyslop saw a bird in Seahouses harbour which resembled an Arctic Skua (*Stercorarius parasiticus*), but which had black, not dark brown, feathers and no tail streamers; it showed none of the behaviour typical of a skua and was often chased by Herring Gulls (*Larus argentatus*).

This bird was seen again on the morning of 1st January 1962 by Dr. E. L. Arnold and D. L. Arnold who also discovered two more black gulls bathing in a creek about half a mile away. One of the latter was almost uniformly dark, while the other had a piebald appearance with large black patches on the upper breast, mantle and wing-coverts. That same afternoon, and in the same area, a very dark gull was disturbed by the two Arnolds and the writer in a flock of roosting Black-headed Gulls (*L. ridibundus*). This bird, which was in excellent plumage, flew off steadily inland and immediately afterwards a very dark individual with heavily abraded feathers and two others which were piebald were located in Seahouses harbour. From their size, shape, flight and behaviour, it was concluded that they were melanistic Black-headed Gulls. The scruffy dark bird remained in

the harbour area and was seen there again on 2nd January by M. C. W. Evans, J. G. Edwards and the writer. On the 3rd, we managed to catch it and took the following description:

> Head entirely black, except for a grey nape patch like a Jackdaw's (*Corvus monedula*); mantle very dark grey, shading to black rump; upper tail-coverts dark grey; tail light grey and heavily abraded. Scapulars, lesser and median coverts light grey, with a few white feathers among the lesser coverts; greater coverts black; primary coverts dark grey; primaries had white shafts and black tips, and in the outermost three the leading edges were black and the trailing edges white or pale grey, while the inner primaries and secondaries were grey, darkening markedly towards the body. All under-parts from chin to under tail-coverts black. Bill dirty red with a black tip; legs sooty red.

I showed this bird to the local fishermen and they informed me that it had first been seen at the beginning of the very cold weather in the last week of December; they had thought it was a skua.

The observations make it clear that at least four different individuals were involved. In each the black patches were symmetrical and could not have been caused by oil or dye. P. R. EVANS

[It is a little unfortunate that no feathers were collected for scientific tests. Many black and grey gulls prove to be soiled and not melanistic at all. In the present case, however, it seems unlikely that the observers could have been deceived by a bird in the hand, particularly as the markings were symmetrical. The recent paper by Bryan L. Sage on "Albinism and melanism in birds" (*Brit. Birds,* 55: 201-225) makes mention of this observation (p. 216) and suggests a link with an earlier record in Co. Durham. If this is a case of hereditary melanism, it would be very interesting to locate the colony concerned and we ask that people keep a watch for such individuals in the future.—EDS.]

Weasel attacking Tawny Owl.—At 3.0 p.m. on 26th November 1961, at Norton, Sheffield, Peter Doherty (aged 15) was watching a Tawny Owl (*Strix aluco*) perched on a log beside a stream, when a Weasel (*Mustela nivalis*) came from undergrowth three feet away and grabbed at it, taking most of its tail feathers. The owl flew up, but travelled only about ten feet and there the boy was able to catch it. He thought that it must be tired or injured and so brought it to me. Apart from its missing tail feathers, its right wing was dislocated. This may have happened while the boy was catching it, but I think that the greater part of the injury resulted from the grip and pull of the Weasel. The boy said that there had been quite a tug while the Weasel held on with its teeth. In view of the bird's injuries I kept it in a conservatory at my home until 3rd May 1962 and after that at large in my garden, but seven months after the attack its wing is still dislocated and its feathers are only just beginning to grow, although it otherwise appears well.

While on this subject it seems relevant to add an observation in connection with the recent notes by T. J. Lawes and J. M. Last on Short-eared Owls (*Asio flammeus*) and a Barn Owl (*Tyto alba*) killing Weasels (*Brit. Birds,* 54: 326-327; 55: 87). At 6.0 p.m. on 15th September 1961, again at Norton, we found a freshly dead Weasel by a hedge near which both Tawny and Barn Owls live. It had a small puncture on each side of its chest and these had penetrated the lungs. I concluded that it had been killed by the talons of an owl and dropped because we came on the scene. W. A. TIMPERLEY

Bonelli's Warbler in Suffolk.—At about 10 a.m. GMT on 29th April 1961, at Walberswick, Suffolk, we encountered a pale leaf-warbler about the size of a Willow Warbler (*Phylloscopus trochilus*). We were first attracted by its song—a short trill on one note of five to seven syllables, lower pitched and slower than the trill of a Wood Warbler (*Ph. sibilatrix*) and without the acceleration. We identified it as a Bonelli's Warbler (*Ph. bonelli*). Its most noticeable field characters were pale under-parts, yellow edgings to primaries and secondaries and a yellow patch near the carpal joint. There was no wing-bar and the yellowish rump was seldom noticed. We succeeded in trapping the bird and the following description was taken in the hand:

Upper-parts: forehead and crown brown tinged olive; superciliary pale creamy yellow (not bright) extending to a point above middle of pale brown ear-coverts; nape and mantle olive-green overwashed earth-brown and shading to yellow-green on rump; upper tail-coverts bright yellow-olive; rectrices brown edged yellow; all wing-feathers brown edged yellow-green on outer webs (especially secondaries) and remiges with paler tips. *Under-parts:* throat to under tail-coverts off-white; axillaries bright yellow; under carpal edgings bright yellow, paler towards coverts which were brown with pale yellow tips. *Soft parts:* upper mandible and end of lower mandible brown, base of lower tinged pink; iris blackish-brown; orbital ring pale cream; tarsus dark pinky-brown. *Measurements:* wing 65 mm., tarsus 19.5 mm., tail 51 mm. *Wing-formula:* 3rd and 4th longest, 2nd 8.5 mm. shorter and between 6th and 7th; 3rd to 6th emarginated.

We were puzzled by the emargination on the 6th primary, but P. Hope Jones informs us that a proportion of nominate *bonelli* do show this—a fact which does not seem to have been previously recorded. The bird was also seen in the hand by, amongst others, H. E. Axell, S. J. Jobson, A. Morley and A. D. Rowe (and by most of these in the field as well). It was last recorded, still singing, at noon on 30th April. This is the seventh record for Great Britain, but the first for the spring and the first for the east coast.

D. J. PEARSON, S. BODDY and M. SMART

[Since this bird was recorded there have been two further records for Great Britain and Ireland, one in Co. Cork (*Brit. Birds,* 55: 92-93) and one on Fair Isle (see over)—EDS.]

Bonelli's Warbler on Fair Isle.—A first-winter Bonelli's Warbler (*Phylloscopus bonelli*), the ninth recorded in Britain and the first in Scotland, was seen and trapped on Fair Isle on 22nd September 1961. It was first located by W. H. Truckle, S. L. White, E. J. Wiseman and D. Wooldridge, and was later watched by a dozen other observers, including G. J. Barnes and the writer, as it fed among the potatoes at Shirva and Brows; these had been withered and beaten down by a hurricane a few days earlier, so that they seldom impeded our view, and in any case the bird was absurdly tame, permitting approach to within two yards. It was searching for food both among the leaves remaining on the stems and in the debris on the earth beneath. For a leaf-warbler it was very grey on the head and upper-parts, and it had silvery-white under-parts and bright green edgings on the wings and tail. No yellow could be seen in the field on the rump or upper tail-coverts, which was puzzling at first as all the available references emphasised this character. However, one of the watchers, P. J. Sellar, stated that the yellow was seldom visible in Bonelli's he had seen in France; and in subsequent correspondence P. Hope Jones confirmed this from his considerable experience at Tour du Valat in the Camargue, adding that the unique combination of grey and white contrasting with the bright green edgings on wings and tail make identification quite easy. These points have since been made independently by I. J. Ferguson-Lees in this journal (*Brit. Birds,* 54: 395-398). The bird had a distinctive call, a harsh and almost disyllabic *clweet* which it uttered frequently as it explored the crop. It was soon captured in a mist-net and the following description was taken in the laboratory:

> Forehead, crown, nape, mantle, back and scapulars greyish-green, with slight yellowish and brownish stippling on crown; lower rump and upper tail-coverts with slight yellowish tinge. All feathers of wings and tail brownish, edged bright green, except for yellow patch at carpal joint and yellow axillaries and under wing-coverts; flight-feathers and tail unworn. Supercilium whitish, short; lores and ear-coverts tinged greyish. Entire under-parts silvery-white with grey tinge on flanks and sides of breast and spot of yellow near shoulder. *Soft parts:* upper mandible horn with pinkish cutting-edge and base, lower mandible pinkish; inside of mouth yellow; eye very dark brown; legs brown with slaty tinge in front and pinkish tinge behind. *Measurements:* wing 59 mm., tail 46 mm., tarsus 18 mm., bill 13.5 mm.; weight 6.4 gm. at 1615 hours GMT. *Wing-formula:* 4th primary longest, 3rd and 5th −0.5 mm., 6th −3.5 mm., 7th −5.5 mm., 2nd −6 mm., 8th −7.5 mm., 1st 4.5 mm. longer than primary-coverts; 3rd to 5th emarginated.

The bird was released at North Haven and flew off to the cliffs; it was not seen again.

PETER DAVIS

Spotted Flycatcher feeding on grasshopper.—Neither *The Handbook* nor D. A. Bannerman's *The Birds of the British Isles* (vol. 2, pp. 265-266)

mentions Orthoptera in the food of the Spotted Flycatcher (*Muscicapa striata*). On 2nd October 1958, at Khanaqin, Iraq, I saw a Spotted Flycatcher catch and eat a grasshopper which was at rest on a lawn. It was of the species *Eremopeza gibbera*, which is about two inches in length.

BRYAN L. SAGE

Dunnock's method of obtaining seeds from antirrhinums.—In the autumn of 1961, at Perivale, Middlesex, two Dunnocks (*Prunella modularis*) frequently visited a suburban flower-bed which contained only a few well-grown plants of the garden antirrhinum (*Antirrhinum majus*). On 26th December, when the ground was frozen, one of them was seen to stretch up and tug at a stem bearing seed heads, thus spilling them, and then rapidly pick up the fallen seeds. It repeated this a number of times, gradually moving round the plant, and then flew up to perch on one of the stems, shaking it with its weight. With wings fluttering to balance, it stayed there only a few moments before dropping back to the ground and immediately crouching to pick up more seeds. It repeated this action eight or nine times in rapid succession and I had the impression that it was associating the act of perching with the finding of seeds on the ground afterwards.

Later the same day this bird, or it may have been the other one, was seen on three further occasions working its way around the plants, reaching up to pull at them and picking up the seeds shaken out. Twice it tugged repeatedly at stems which carried neither seed heads nor leaves, though this action appeared to cause seeds to fall from adjacent stems. Once three House Sparrows (*Passer domesticus*) took advantage of what was happening and rushed in to seize fallen seeds, but they were not seen attempting to shake any down for themselves.

C. J. O. HARRISON

Grey Wagtail nesting in Sand Martin's burrow.—On 23rd April 1961, while walking up the River Rye in north Yorkshire, I was very surprised to see a hen Grey Wagtail (*Motacilla cinerea*) fly out of a burrow made by Sand Martins (*Riparia riparia*) in the bank, some five feet above the river bed. With the aid of a torch I was just able to distinguish the nest, but not its contents, about two feet down the burrow. I returned to the site on the 27th and both adults were then feeding young in the nest. Thus the clutch must have been completed by about 14th April—a fairly early date—but it was the choice of nest-site which was the most remarkable feature. Of eight other nests I found in that area during 1960 and 1961, three were in open depressions in mud banks, two were under grass tufts on grassy banks, one was

among tree roots over the water and two were under bridges.

IAN HARMER

[Grey Wagtails not infrequently nest in drainage pipes in bridges and walls (two sites not specifically mentioned in *The Handbook*), but in this case the use of a Sand Martin's burrow and the distance to the nest inside the hole both seem unusual.—EDS.]

Review

Photographing Garden Birds. By C. H. S. Tupholme. Faber, London, 1962. 127 pages; 4 colour and 6 monochrome photographs. 18s.

Some excellent suggestions are given on methods of attracting wild birds into the garden by establishing various trees, shrubs and plants to provide food and cover. There are ideas for making a pond for drinking and bathing, for feeding devices, for the positioning of nest boxes and for supplying nesting materials. Such information is given with the primary aim of getting birds within range of the camera, but it will be no less useful to anyone wishing merely to increase the avian population of a garden.

The author makes it clear that he himself is interested only in 35 mm. cameras and, although there is some information on the use of black-and-white film, he is concerned mainly with colour transparencies. He gives descriptions of the cameras he most favours and the reasons for his choices. But then there follows a rather lengthy discussion of such subjects as supplementary lenses, depth of field, extension tubes, image ratio tables, and effective apertures for close-range work, which all seems unnecessarily detailed. Next we have a chapter on making hides for use in the garden. These include ones for concealing a camera operated by remote control, for hiding the photographer with his apparatus, and for working from inside the house. High-speed flash is used extensively and so there are instructions for this and advice on positioning the reflectors.

The photographic illustrations in this book are very disappointing, both in quantity and quality. The four colour ones are so far from accurate that they give a completely false impression of the birds concerned. In the monochrome ones, which were all taken at the same perch, the birds are so large that in each picture the bill almost touches one end while the tail nearly disappears from the other. Such examples are not a good advertisement for the author's methods, nor indeed for the book as a whole. Nevertheless, *Photographing Garden Birds* is full of useful tips and all bird-photographers, whether experts or novices, will learn something from it. ERIC HOSKING

PLATE 58. Young Golden Eagle (*Aquila chrysaetos*) in nest, Co. Antrim, with the remains of Scottish Blue Hares (*Lepus timidus scoticus*). These hares are not found in Ireland and it is believed the adult eagles carried them across from Scotland (page 274) (*photo: C. D. Deane*)

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Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and layout are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing systematic lists, reference lists, tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds,* with the exception of the changes listed in *British Birds* in January 1953 (46: 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Subspecific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1962" and no other, except in tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1" whichever most suits the layout of the table concerned. It is particularly requested that authors should pay attention to reference lists, which otherwise cause much unnecessary work. These should take the following form:

TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, 42: 129-134.

WITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits.* London. p. 34.

Various other conventions concerning references, including their use in the text, should be noted by consulting examples in this issue.

4. Tables should be numbered with arabic numerals, and the title typed above in the style used in this issue. The title and any headings within the table should not be underlined, because this sometimes makes it difficult for the editor to indicate the type to be used. It is most important that the layout of each table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that tables must either fit into the width of a page, or be designed to fit a whole page lengthways. All tables should be self-explanatory.

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15 Silchester Road.
S. Leonards on sea
June 30th 1916.

to H. F. Witherby Esq.

Dear Sir.

For some considerable time I have had hints that you & other ornithologists entertain doubts as to the authenticity of some of the rare birds I get & I must admit not without reason. I will endeavour to show you as briefly

If you can suggest anything for me to do to allay these suspicions I should be glad to assist, but I cannot promise to give the names & addresses of every one if they object.

Apologising for troubling you

I am Yours faithfully

E. W. Preston

I have no doubt
birds I saw &
a single one in two

British Birds

Vol. 55 No. 8

AUGUST 1962

Editorial

Setting the record straight

DEPARTING FROM our normal pattern, we are devoting the whole of this much enlarged issue of *British Birds* to a single main subject, known already to some, and soon to be familiar to many, as the case of the Hastings Rarities.

Half a century ago, when modern ornithology was struggling to emerge as a science from the passion for collecting skins and egg-shells, the interference of social and commercial factors and ambitions was not yet effectively excluded. There was good money to be made in supplying rare birds and rare eggs to well-to-do collectors. There was social prestige to be gained from owning a collection adorned by specimens which rival collectors lacked. The tally-hunting spirit, now canalised into such innocuous pursuits as keeping a life-list, demanded complete series of specimens of as many species as possible, especially of the rarest. Bird-watchers were few and sight records were usually dismissed, without serious consideration, on the score that "What's hit's history, what's missed's mystery". The trinity of the casual gunner, the busy taxidermist and the wealthy collector still formed the backbone of the system by which additions were made to lists of local, county or national rarities, and the nexus between them was cash.

In this recent but already remote world the unceasing efforts of the custodians of ornithological standards were handicapped not only by powerful and often secretive influences, but by a far more limited and uneven command of critical techniques, and especially of background knowledge, than we enjoy today. It was not easy to deceive them, but it was by no means impossible. The sad story which we now have to tell shows beyond doubt that in the case of the Hastings Rarities it was in fact done.

The record also shows that, even at the time, quite a few ornithologists recognised or suspected what was happening and finally brought

the business under control, although without being in a position then to go back over the past. Our predecessor, H. F. Witherby, took the lead in this. The two papers which follow, now completed after several years' work, reach conclusions which will not, therefore, come wholly as a surprise. Nevertheless, they are painful and shocking. It ought, as our predecessors naturally supposed at the time, to be safe to assume that this sort of thing simply would not happen. In exposing the falsity of these Hastings records, our sympathy goes out to the then leaders of British ornithology, including the editors of *British Birds*, who fell into the error of disbelieving that such a contemptible imposition on their good nature and good faith could be so cynically and persistently carried out. One who is fortunately still with us, our colleague Dr. N. F. Ticehurst, one of the finest and best-liked British ornithologists of our time, was especially badly treated. The record shows that, faced with the firm requirement that all new specimens should be submitted to his independent expert scrutiny, the deception finally collapsed. Had he been afforded that opportunity of examining the evidence while it was fresh, he must undoubtedly have found then what we have established now.

Such a volume of material lends itself to statistical analysis and we are much indebted to J. A. Nelder for performing that large and exacting task in the first paper. In the course of it he has perhaps extended the field of statistical method in ornithology and his tests and conclusions, set out with the greatest clarity, most closely complement and confirm our own independent investigations. The latter are described in the main paper which then follows and includes a history and lists of the records.

Our task is done. Its innumerable difficulties have, we are glad to say, been mitigated by the almost invariable helpfulness of those whom we have had to consult on so many matters, and by the opportunity which it has afforded to demonstrate new or improved means of upholding truth against error. It has also, we hope, shown that no trouble can be too great and no self-discipline and scrutiny too searching to ensure that the record is kept straight.

A statistical examination of the Hastings Rarities

By J. A. Nelder

THIS PAPER IS an attempt to establish the consistency or otherwise of the great flood of rarities from east Sussex and west Kent during the first two decades of this century, from the internal evidence presented by the statistical aspects of the records themselves. The consequences of various hypotheses which assume the validity of all the records will be tested against the numerical evidence.

METHODS

For the analysis, all records of rarities for the counties of Kent and Sussex for the years 1895-1954 inclusive have been extracted from Walpole-Bond (1938), Harrison (1953), the *South-Eastern Bird Reports* for 1936-47, the *Kent Bird Reports* for 1952-54 and the *Sussex Bird Reports* for 1948-54. Between them these publications cover the period and region required.

The region has been split up into three parts: area X is contained inside a circle with centre Hastings Pier and radius 20 miles, except that the whole of Romney Marsh (apart from Hythe) is included; area YS is the rest of Sussex not in area X and area YK is the rest of Kent similarly. The inclusion of the whole of Romney Marsh in X is necessary because a number of records in the sources do not specify exact places in the Marsh, and the allocation of these records to the correct area would be problematical if the 20-mile radius definition were strictly adhered to.

The 60-year span has been divided into two eras, 1895-1924 inclusive, called A, and 1925-1954 inclusive, called B. The records dealt with here thus fall into one of six categories, XA, XB, YSA, YSB, YKA or YKB. These six combinations of areas and eras will be termed area-eras for short.

For the purposes of this paper a rarity is defined as a species whose recorded occurrences have been completely enumerated in the books and reports mentioned, and which has not occurred on the average more than once per year in any of the six area-eras.

The reduction to tabular form of such a heterogeneous collection of data as these reports of occurrences of bird rarities over the 60 years is not easy. The records exhibit all gradations from virtual certainty about the identity of the bird to considerable vagueness, and some rules

for their acceptance or rejection are essential. Within the limits necessarily imposed by the "strictness" or "leniency" of the sources, I have tended towards strictness and the reduction of acceptances to a minimum. No record has been accepted for the purpose of the following analysis unless all the following conditions are satisfied:

(i) The name of the observer in the field or identifier (if bird dead) must be given in the source.

(ii) The date must be given to within a year.

(iii) No doubt must be expressed by the author (or editor) about the validity of the record; if a record occurs in more than one source no doubt must be expressed by any of the authors (or editors). All square-bracketed records have thus been rejected. (In a few cases it was not quite obvious whether the author was expressing doubt or not, but, in accordance with the general principle, such records were rejected.)

(iv) The bird must have been *seen*; records based on birds heard but not seen have been rejected.

(v) The bird must have been seen or taken from the land; no records of birds observed from ships (including lightships) have been admitted.

Since occurrences of rarities other than singly are important in these data, some formal definition of an occurrence is required. In this paper, two birds are said to have occurred together (and so to constitute one occurrence) if they were seen or taken within five miles and within seven days of each other. A set of more than two records of individual birds forms a single occurrence, if, when arranged in chronological order, every adjacent pair satisfies the condition for a single occurrence. A set of records also forms a single occurrence if the birds were specifically recorded as having come from a flock, even though successive records were not all within seven days of each other. Occurrences relating to one bird, two birds and more than two birds will be called *singular, dual* and *plural* respectively, while *multiple* will be used to cover dual and plural combined. Sometimes reports are vague about numbers and in such cases the minimising rule is brought into play: thus "several" is taken to mean "three" (i.e., the smallest integer greater than two), "a small flock" is taken as "four", and if the author or editor expresses a belief that several records refer to the same individual, this is taken to be so and only a single occurrence is allowed.

For the purpose of analysis an index of the rarity of a species is required. In this paper the number given for England in *The Handbook* is used as an index and, as before, when any doubt is expressed there about numbers the smaller one is taken. Again records from sea-based observers have been rejected. Certain objections to this

TABLE 1—HYPOTHETICAL EXAMPLES OF TWO-WAY TABLES (SEE TEXT BELOW)

	(a) Exact proportionality		(b) With random errors added (not significantly different from proportionality)		(c) Significant departure from proportionality	
	Winter	Summer	Winter	Summer	Winter	Summer
lass II	100	300	98	310	100	200
lass I	50	150	54	145	50	150
	$\chi^2_1=0$		$\chi^2_1=0.21$ (0.7>P>0.5)		$\chi^2_1=7.94$ (P<0.01)	

index can be raised; in particular, it does not cover the whole period under investigation, and hence weights records in favour of the earlier period. Its main advantage is that it was compiled by one man, independently of the present investigation, and is, therefore, consistent and objective. In the main, species and subspecies will be divided into three classes: class I rarities, which have less than 20 accepted English examples in *The Handbook*; class II, with 20-99 examples (inclusive); and class III, consisting of those whose occurrences are not enumerated in *The Handbook*. It is possible that some class III species have actually less than 100 records over the period covered by *The Handbook*, and so overlap class II, because *The Handbook* does not appear to be entirely consistent in this matter. However, this overlap, if it exists, is small and unimportant.

The only statistical, in the sense of probabilistic, techniques used in the following analysis are the χ^2 (chi-squared) goodness-of-fit test and the Poisson distribution. The χ^2 test is applied here mostly to frequencies arranged in two-way tables, for example the frequencies of the occurrence of rarities of different classes in different seasons. The simplest situation in such a table occurs when the relative frequencies in one set of categories (e.g. rarity classes) are the same for all categories in the other set (seasons). The first part (a) of Table 1 shows such an ideal situation. Each rarity group has three times as many summer records as winter, and each season has twice as many class II records as class I. The hypothesis that the relative frequencies are of this simple type is called in statistical parlance the *null hypothesis*. Of course in any particular sample the frequencies would almost never be exactly proportional, even if the null hypothesis were true, because of random errors in them. These random errors might give rise to something like Table 1(b). Here the hypothesis of proportionality is not disproved. However, these random errors can only distort the picture to a certain degree and χ^2 can be regarded as a measure of

whether this distortion has reasonably been exceeded in any particular case.

Under certain conditions the relative frequencies of different values of χ^2 turning up can, if the null hypothesis is true, be calculated. The average value of χ^2 equals a quantity called the number of degrees of freedom, which itself depends only on the form of the table, not on the numbers in it. A value of χ^2 much in excess of the average value means that a very unlikely event has taken place, if the null hypothesis is true, and hence that it should be discarded for some other hypothesis more in accordance with the facts. Thus in Table 1(c) while class I has three times as many summer as winter records, class II has only twice as many. This gives a large χ^2 and tends to discredit the null hypothesis. Similarly, for a χ^2 with two degrees of freedom (written χ^2_2), a value of six would be exceeded in only 5% of cases if the null hypothesis were true. Thus values of χ^2_2 greater than six are said to be significant at the 5% level, or significant P=0.05, and provide considerable evidence that the null hypothesis is false. It should be pointed out that the null hypothesis can fail to be true in two rather different ways. In one situation, the true frequencies may not be proportional, so that occurrences among class III rarities might have a relatively greater frequency in winter than occurrences in the other two classes; this is a systematic deviation from the null hypothesis. The other situation occurs when the random deviations are unusually large, but the true frequencies are still proportional; this may occur if the thing being measured comes from a heterogeneous population, made up of several sub-populations with unequal chances of being represented. Thus our class III rarities comprise a number of species of which some are relatively much commoner than others, and this may produce a random deviation larger than average. In practice it is often possible to distinguish the two kinds of deviations, since one has a pattern while the other has not. In the analysis which follows we shall meet examples where the null hypothesis is well supported, and where there are deviations both random and systematic from it.

The Poisson distribution is a theoretical probability distribution, often useful in the description of the frequencies of rare events. It is completely specified by its mean value. For a general description of χ^2 and this distribution a standard statistical textbook should be consulted (e.g. Snedecor 1946).

THE RESULTS

The results to be discussed embrace 1,015 occurrences, involving 1,360 birds of 168 species and subspecies. Subspeciation is as given in *The Handbook*. This is generally satisfactory for our purposes, but the Yellow Wagtail (*Motacilla flava*) complex has presented difficulties. In particular the "Sykes" type (resembling *beema*) must be a class I rarity

TABLE 2—TOTAL OCCURRENCES IN DIFFERENT RARITY CLASSES

An explanation of the area-eras will be found on page 283, and of the rarity classes on page 285

Area-era	Class I	Class II	Class III	Total
XA	243	108	165	516
XB	54	51	103	208
YSA	15	16	45	76
YSB	19	13	32	64
YKA	11	11	22	44
YKB	26	28	53	107
Total	368	227	420	1,015

by our definition, though modern records make it much commoner and this bird actually makes up nearly 10% of the class I records for the rest of Kent in the years 1925-54 (YKB). However, since *The Handbook* is being used for the rarity index, no exceptions are made to its classification of subspecies and records.

The complete list of records used (which is not given in full here, but is being deposited at the Edward Grey Institute, Oxford) has been split up in various ways for the investigation, and the following aspects will be presented and discussed: the relative frequencies of singular, dual, plural and total occurrences in the three rarity classes for the six area-eras; also the distribution of occurrences in the various seasons of the year and in different years throughout the periods concerned.

The distribution of the total number of occurrences

We consider first the total number of occurrences in each rarity class for each area-era, the relevant figures being shown in Table 2. The most obvious feature of these figures is that the distribution of the occurrences among the rarity classes in the Hastings Area for the period 1895-1924 (XA) is quite different from the distribution in the remaining area-eras. A χ^2 test carried out on these remaining area-eras gives $\chi^2_8 = 3.55$, showing no significant difference in the proportions of the three rarity classes. Considering the heterogeneous nature of the data, the agreement is remarkably good. Table 3, however, compares Hastings (XA) with the total of the remaining area-eras and it will be seen immediately that XA has nearly twice the proportion of class I rarities that the remainder has, balanced by a deficiency of class III

TABLE 3—TOTAL OCCURRENCES FOR HASTINGS 1895-1924 COMPARED WITH ALL OTHER AREA-ERAS COMBINED

Area-era	Class I	Class II	Class III	Total
Hastings (XA)	243	108	165	516
Remainder	125	119	255	499

rarities. In contrast to the homogeneity of the remainder of the area-eras, these discrepancies are highly significant, producing the enormous χ^2_2 value of 57.40.

So far we have considered only the distribution of the numbers in the different rarity classes, without looking at the total number of occurrences in the different area-eras. It is clear from inspection of the figures for the rest of Sussex and Kent (YS and YK) that the trend in the two regions over the period of time concerned is quite different. While the total number of records for YS has actually declined slightly for era B compared with era A, that for YK has markedly increased. (It should not be assumed from the YS figures that the amount of bird-watching has gone down in that area over the period considered, because if a species has too many records in the second period for it to be enumerated completely in the sources, or if there are more than 30 records in that period, its contribution is automatically eliminated from these figures by the rules previously laid down. This tends to minimize the number of records for the second era, but does not bias the other comparisons we are making.) In the absence of agreement between the trends for these two areas we cannot say, with any conviction, what the figures for XA ought to be. Incidentally, even if YS and YK had agreed in their trends over the two eras, no significance test comparing them with X would have been valid, since we have deliberately chosen XA for investigation on account of its unusually large total of rarities (the fact of this choice does not invalidate significance tests on the other aspects we are considering). It is fair to note, however, that the trend for the Hastings Area does not agree with either of the other areas. It is nearer to YS, but to be comparable the XA figure should be about 247 instead of the 516 actually recorded.

The distribution of numbers at each occurrence

Considering class I rarities first, and dividing occurrences into singular and multiple (there being insufficient records in most area-eras to divide the multiple occurrences into dual and plural), we get Table 4. The proportion of multiple records in XA (25.1%) is much higher than in the other area-eras (average 12.0%). A χ^2 test excluding XA gives $\chi^2_4 = 2.00$, indicating homogeneity among the "remainder" group, while comparison of XA with the remainder gives $\chi^2_1 = 8.65$ ($P < 0.01$), showing that XA disagrees with the remainder. This is even more marked if we divide the multiples into duals and plurals as shown in Table 5. Here $\chi^2_2 = 12.76$, a more extreme value than the previous $\chi^2_1 = 8.65$. The remainder group has only one plural occurrence for class I rarities—the Paddock Wood Snow Finches* of 1906 (*Handbook*, 1: 155).

*All scientific names are given in the final appendix on pages 382-384.

TABLE 4—DISTRIBUTION OF SINGULAR AND MULTIPLE OCCURRENCES FOR CLASS I RARITIES

An explanation of the area-eras will be found on page 283, of singular and multiple occurrences on page 284 and of the rarity classes on page 285 (see Appendix on pages 297-298)

Area-era	Singular	Multiple	Total
XA	182	61	243
XB	46	8	54
YSA	14	1	15
YSB	18	1	19
YKA	10	1	11
YKB	22	4	26
Total	292	76	368

The situation with class II rarities is very much the same as with class I; the proportion of multiple records for XA is 26.9%, while for the remainder group it is 12.6%, with YSA the highest at 18.8%. Again the remainder group gives a low $\chi^2_4=1.20$, indicating homogeneity, while comparison of XA with the remainder gives a significant $\chi^2_2=7.36$ ($P<0.05$).

With class III rarities the situation is less clear cut, for the XA proportion of multiple records, here 22.8%, is slightly less than that for YSA, which has 24.4%. This difference of YSA from the rest of the remainder group is almost entirely due to records for one species, the Glossy Ibis, which contributes four out of the 15 multiple occurrences for YSA. The same species contributes three out of the 38 multiple occurrences for XA. The result of this is that XA and YSA do not differ significantly, though XA differs from the remaining four area-eras ($\chi^2_2=7.29$). One other aspect of the data deserves mention. In the remainder group, the percentages of plural occurrences for class III, II, and I rarities are 5.1, 2.5, and 0.8 respectively; that is, they fall steadily, being greatest in the least rare class. This is what one might expect *a priori*. However, in the XA group, the percentages (in the same order) are 9.1, 5.6 and 9.9, and show no such trend.

TABLE 5—DISTRIBUTION OF SINGULAR, DUAL AND PLURAL OCCURRENCES FOR CLASS I RARITIES

Area-era	Singular	Dual	Plural	Total
Hastings (XA)	182	37	24	243
Remainder	110	14	1	125
Total	292	51	25	368

The distribution of occurrences by season

For nearly 97% of the occurrences, the month of the occurrence is given in the source. Where it is not given, the occurrence is excluded from the analysis in this section. Where a single bird stayed for several months, the first month is taken. If a flock was present and members were shot from it or seen in more than one month, then the month of the first record is again used. The numbers for most of the months in most of the area-eras are too small to allow any accurate comparisons, so they have been grouped in four seasons of winter (December-

TABLE 6—DISTRIBUTION OF OCCURRENCES BY SEASONS

An explanation of the area-eras will be found on page 283, and of the rarity classes on page 285

Area-era and rarity class		Number of occurrences: Spring (Mar/May)	Summer (Jun/Aug)	Autumn (Sep/Nov)	Winter (Dec/Feb)	Total
XA	I	101	42	63	36	242
	II	25	38	29	13	105
	III	42	35	56	27	160
	Total	168	115	148	76	507
XB	I	16	15	16	4	51
	II	12	11	27	1	51
	III	35	16	41	10	102
	Total	63	42	84	15	204
YSA	I	5	0	7	3	15
	II	6	1	7	2	16
	III	7	3	18	7	35
	Total	18	4	32	12	66
YSB	I	6	4	9	0	19
	II	3	2	6	2	13
	III	9	11	8	3	31
	Total	18	17	23	5	63
YKA	I	2	3	3	3	11
	II	4	2	3	0	9
	III	1	3	6	7	17
	Total	7	8	12	10	37
YKB	I	11	9	3	3	26
	II	12	8	7	1	28
	III	20	6	14	10	50
	Total	43	23	24	14	104

February), spring (March-May), summer (June-August) and autumn (September-November). The frequency of occurrences for all area-eras, rarity classes and seasons is given in Table 6.

The distribution by seasons is much more variable in the remainder group than the previous distributions considered. A remarkable feature is the growth of spring records in the rest of Kent from 18.9% in era A to 41.3% in era B, while the rest of Sussex shows no such change though summer records have increased there. Both these areas agree, however, in showing a decline in the proportion of autumn and winter records as we pass from era A to era B. YS shows a fall of 22.3% from 66.7% to 44.4%, and YK a fall of 23.0% from 59.5% to 36.5%. By contrast, the autumn and winter records for the Hastings Area rise slightly from 44.2% to 48.5%. It is also noticeable that, while the seasonal distributions of total occurrences for XB and YSB are very similar (giving $\chi^2_3 = 1.26$), those for XA and YSA are quite unlike each other ($\chi^2_3 = 15.70$). The XA records have another property not shared by any of the other area-eras in that they have a considerably greater proportion of spring records for class I rarities than for classes II and III.

The distribution of records by years

The relevant data on distribution by years are given in Table 7 for all area-eras and rarity classes. Considering first the earlier era A, we find that for both YS and YK the distribution of the number of class I rarities is very close to a Poisson; the actual frequencies and the theoretical ones of the Poisson distributions with the same means are shown in Table 8.

These good fits to the theoretical distributions suggest strongly that there were no large differences in the numbers of class I rarities reaching these areas each year during this period, or in the intensity of observations made on them; for, if there had been any such large differences, the actual frequency distributions would have had longer "tails" and the Poisson model would no longer have fitted well. The distribution of class I rarities in XA is obviously quite unlike the last two considered. In the first place it shows strong time trends, there being a sharp increase in the early 1900s followed by an equally sharp decrease after 1916. In such circumstances it is unreasonable to expect a theoretical distribution to fit well and, in fact, the Poisson distribution is a very bad fit here. It is somewhat surprising that the peak years in X, namely 1905, 1914 and 1915, do not correspond with any peaks in the other two regions.

Differences between regions are much less remarkable for classes II and III. In YSA and YKA the Poisson fits less well, due doubtless to increasing heterogeneity in the population sampled, while the distributions for XA are less extreme than that for XA class I.

TABLE 7—DISTRIBUTION OF OCCURRENCES BY YEARS

An explanation of the area-eras will be found on page 283, and of the rarity classes on page 285

Era A

Area-era and rarity class		1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	Total
XA	I	2	4	2	0	1	4	7	7	10	7	19	9	13	8	15	6	14	14	8	27	22	15	6	4	3	5	0	3	6	2	243
	II	3	2	0	2	1	1	7	3	4	8	7	4	3	3	3	2	3	2	7	9	7	5	1	5	2	3	2	4	2	3	108
	III	3	2	5	4	3	6	3	9	11	9	16	9	3	6	4	7	10	5	5	5	5	4	4	4	4	4	1	5	2	7	165
	Total	8	8	7	6	5	11	17	19	25	24	42	22	19	17	22	15	27	21	20	41	34	24	11	13	9	12	3	12	10	12	516
YSA	I	0	0	0	1	0	1	0	1	1	0	1	0	0	1	3	1	1	0	2	0	0	1	0	0	0	0	0	1	0	0	15
	II	0	0	1	1	0	0	1	0	0	3	3	1	2	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	16
	III	0	1	1	0	4	1	3	1	3	1	0	3	3	4	5	2	1	3	0	1	0	0	1	1	1	1	0	2	0	2	45
	Total	0	1	2	2	4	2	4	2	4	4	4	4	5	5	8	3	2	3	2	1	0	1	1	2	1	1	1	5	0	2	76
YKA	I	0	1	1	0	1	0	0	2	0	1	1	1	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	11
	II	0	0	0	1	2	0	0	0	0	1	0	0	3	1	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	11
	III	1	3	1	1	0	0	0	0	2	0	0	4	1	1	1	0	0	1	1	0	1	1	0	0	1	2	0	0	0	0	22
	Total	1	4	2	2	3	0	0	2	2	2	1	5	6	2	1	0	2	2	1	0	1	1	0	0	1	2	1	0	0	0	44

Era B

		1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	
XB	I	0	1	0	0	0	0	2	1	2	3	3	6	3	1	0	0	0	1	0	1	0	3	3	3	2	4	5	4	3	3	54
	II	2	1	1	1	1	0	2	2	0	1	1	0	2	2	0	1	2	0	2	0	0	0	2	3	2	5	7	4	2	5	51
	III	5	1	0	3	1	0	1	0	2	3	3	6	5	4	2	1	0	2	0	1	1	2	6	1	6	11	7	10	7	12	103
	Total	7	3	1	4	2	0	5	3	4	7	7	12	10	7	2	2	2	3	2	2	1	5	11	7	10	20	19	18	12	20	208
YSB	I	0	1	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	4	2	1	2	2	19
	II	0	0	0	0	0	0	1	0	0	2	0	0	0	1	0	0	0	1	0	0	0	1	0	3	1	2	0	1	0	0	13
	III	0	1	1	2	3	0	2	2	2	0	0	1	4	0	0	0	0	0	0	1	0	0	1	2	3	2	1	2	1	1	32
	Total	0	2	1	3	3	0	4	3	2	2	0	1	4	1	0	0	0	1	0	1	0	1	3	7	4	8	3	4	3	3	64
YKB	I	0	0	0	0	0	0	0	0	1	1	0	1	0	1	1	0	0	2	2	0	1	0	0	0	1	4	2	1	4	4	26
	II	0	1	1	0	0	0	0	1	0	2	1	1	1	0	0	1	0	0	1	0	0	2	0	3	0	2	1	1	4	5	28
	III	0	0	0	1	1	0	0	2	0	0	2	2	1	0	1	0	2	2	2	3	1	1	1	0	1	5	6	3	10	6	53
	Total	0	1	1	1	1	0	0	3	1	3	3	4	2	1	2	1	2	4	5	3	2	3	1	3	2	11	9	5	18	15	107

TABLE 8—THE NUMBER OF CLASS I RARITIES PER YEAR IN THE REST OF SUSSEX AND KENT DURING 1895-1924

	Number per year	Years with this number	Poisson frequencies
Rest of Sussex (YSA)	0	18	18.2
	1	10	9.1
	2	1	2.3
	3	1	0.4
Rest of Kent (YKA)	0	21	20.8
	1	7	7.6
	2	2	1.4
	3	0	0.2

In era B, we see a number of trends in time which make any agreement with a simple theoretical model out of the question. The major factor is the post-war increase in bird-watching, with its resulting effect on the number of rarities seen from 1946 onwards. Conversely, the war itself has depressed the number of records in X and YS below that of the pre-war years (although YK does not seem to show this), while during the period 1925-1939 there seems to be a trend towards an increasing number of records. In spite of these effects of the number of observers (for that is what they most likely are), the figures show two points of interest. One is that the post-war boom in bird-watching has increased total records in all regions by much the same proportion when compared with the 1925-1939 period. The figures are 3.3 to 1 for X, 3.0 to 1 for YS and 3.9 to 1 for YK. The other point is that, although the post-war records for class III rarities in the X area are now running at a level higher than the mean for era A, while class II rarities are about equal, the post-war bird watchers have not managed to average even half the number of class I rarities per year that XA shows, while their best effort, five in 1951, is less than a fifth of the peak year (1915) in XA.

DISCUSSION

We began this investigation by noting the remarkable number of rarities recorded from the Hastings Area during the earlier part of this century. No attempt has been made to assess the intrinsic probability of obtaining so many rarities from a relatively small area in such a short time, for the obvious reason that the information necessary to determine such a probability—such as numbers of observers, intensity of observation and actual totals of rare birds to be seen—is almost wholly lacking. Instead we have classified the records in various ways and compared the distributions for the Hastings Area so obtained with those for two neighbouring areas, and during two eras. A number of striking differences in these distributions has been

obtained, and most of them have been in the direction of making XA, the Hastings Area for 1895-1924, the odd one out. We now consider what hypotheses would have to be adopted to explain these differences, assuming the validity of all the records.

For the total number of occurrences in the three rarity classes, we found XA to be quite different from the remainder of the area-eras which did not differ significantly among themselves. This discrepancy in XA is unlikely to be due simply to more or more enthusiastic observers, since the effect of this in YK, as shown in the differences between YKA and YKB, has been to leave the proportions in the rarity classes almost unchanged. Nor can X be a specially good area for class I rarities, judging by its performance during era B and since (when, in spite of the establishment of an observatory at Dungeness, there has still been no exceptional proportion of class I rarities). We must thus postulate observers who failed to report many class II and III rarities while recording all class I rarities. Also the evidence from the distribution by years shows that, to obtain the number of class I rarities actually recorded for XA, something more than twice the activity of post-war observers would be required. Whether there is any direct evidence either of the suppression of lesser rarities or of this enormously increased activity in the XA area-era I must leave others better qualified to say, but the possibility seems inherently unlikely.

The distribution of the numbers at each occurrence for class I and class II rarities shows XA to have an excessive number of multiple occurrences when compared with the rest of the area-eras. Here again a mere change in the number of observers cannot account for it, since the proportion of multiple occurrences has remained effectively unchanged for YS and YK in both eras, even though the type of observation has largely changed from shooting to watching and the number of observers has greatly increased. Again to judge by the performance of XB, X has not recently been a specially good area for multiple occurrences. Hence we must suppose XA to have had observers exceptionally skilled in detecting and collecting multiple occurrences. Now although our definition allows a certain separation in both space and time for the birds in a multiple occurrence, in fact the birds in most multiple occurrences were from the same place and date, or from what was stated to be the same flock at different dates. It is difficult to conceive of an observer who will produce markedly more multiple occurrences than average. For if a person is skilled enough to track down one rarity he surely will not omit to look around for the possible presence of others of the same species. Nevertheless, the presence of such unlikely types seems to be the only suitable explanation, assuming that we can discard the possibility, even among class I rarities, that some single occurrences were suppressed.

The changes in the distribution of rarities by seasons, although not exactly the same for YS and YK, are in one respect similar: the percentage of spring and summer records has risen as we pass from era A to era B. This might perhaps be the expected consequence of a changeover from shooting, which is primarily an autumn and winter activity, to bird-watching, which is much more an all-the-year-round activity. The greater rise of spring records in Kent than in Sussex is probably a reflection of a real difference in the numbers of spring migrants passing through the two counties, which seems likely for reasons of geography. From the position of the X area, one would expect it to behave more like the rest of Sussex than the rest of Kent. This is so in era B where, as we have shown above, the distribution by seasons of records in XB and YSB do not differ significantly. In era A, by contrast, the spring and summer percentages are both greater for X than for YS, and slightly greater for XA than for XB. Thus, once again, the XA records need a special hypothesis to account for them. The agreement between XB and YSB suggests, also once again, that it is the observers whose activities must be different. For their era they were more active in the spring and summer than observers in the rest of the two counties.

The distribution of records by years adds a further anomaly to the XA records, in that the frequencies for yearly numbers of class I rarities fit well to a simple theoretical distribution for YSA and YKA, but not to XA. The YSA and YKA records thus suggest a more or less static situation with regard to both numbers of rarities and numbers and activities of observers, while XA suggests violent fluctuations in one or the other or both. The era B records are interesting in showing that a trend like the post-war increase in bird-watching is reflected very similarly in all three areas, which we might expect *a priori*, in contrast to the situation in era A when area X is so different from the other two regions.

It will now be clear from the foregoing discussion that if we accept all the XA records as genuine we are led to postulate an extraordinary situation regarding the activities of observers operating in this area-era. While the apparent results of their activities cannot be proved to be impossible, they appear so inherently unlikely as to call very seriously in question the basic assumption that all the XA records are genuine. I conclude that the data themselves constitute a strong *prima facie* case for a thorough investigation into the circumstances in which the Hastings Rarities came into existence.

SUMMARY

(1) A statistical investigation has been made of certain aspects of the many rare birds recorded in east Sussex and west Kent in the era 1894-1924 (the "Hastings Rarities"), using other areas in Kent and Sussex and a later era (1925-1954) for comparison.

(2) The basic unit for the analysis is an occurrence, which may involve one, two or more birds. Species and subspecies are classified into three rarity classes based on the number of English occurrences given in *The Handbook*. The distribution of the total number of occurrences of birds in three different classes of rarity shows the Hastings records in the era 1895-1924 to be anomalous, the remaining area-eras being consistent with one another.

(3) The distribution of the numbers at each occurrence for species of the greatest rarity is also shown to be anomalous for Hastings 1895-1924 when compared with the remaining area-eras.

(4) The proportion of spring and summer records for the two areas excluding Hastings is shown to have increased from era 1895-1924 to era 1925-1954, but to have decreased for Hastings. Other anomalous results involving the Hastings 1895-1924 records are pointed out.

(5) The distribution of occurrences year-by-year over the period 1895-1924 is shown to fit a simple theoretical distribution for the two areas excluding Hastings, but not to fit any such distribution for Hastings. Certain trends common to all areas for the period 1925-1954 are pointed out and the results compared with those for the earlier period.

(6) Auxiliary hypotheses necessary to account for these anomalous results are considered, on the assumption that all the records are genuine.

(7) It is concluded that these hypotheses are exceedingly unlikely to be true and that the basic assumption of the validity of all the records must be questioned.

ACKNOWLEDGEMENTS

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Appendix—Rarity classes of species and subspecies analysed

A full explanation of the rarity classes will be found on page 285. Scientific names are given in the final appendix on pages 382-384

CLASS I (rarities with 1-19 English examples accepted in *The Handbook*)

Wilson's Petrel
Madeiran Petrel
Madeiran Little Shearwater
Cape Verde Little Shearwater
Audubon's Shearwater
Mediterranean Shearwater
North Atlantic Shearwater
Bulwer's Petrel
Little Egret
Great White Heron
American Bittern
Blue-winged Teal
King Eider
Kite
Lesser Kestrel
Sociable Plover
Semipalmated Ringed Plover
Killdeer
Caspian Plover
American Golden Plover
Asiatic Golden Plover
Dowitcher

Upland Sandpiper
Slender-billed Curlew
Solitary Sandpiper
Spotted Sandpiper
Greater Yellowlegs
Lesser Yellowlegs
Marsh Sandpiper
Grey-rumped Sandpiper
Terek Sandpiper
Baird's Sandpiper
White-rumped Sandpiper
Semipalmated Sandpiper
Buff-breasted Sandpiper
Broad-billed Sandpiper
Black-winged Pratincole
Ivory Gull
Great Black-headed Gull
Mediterranean Black-headed Gull
Bonaparte's Gull
Sooty Tern
Bridled Tern
Yellow-billed Cuckoo
Black Lark
Calandra Lark
White-winged Lark
Short-toed Lark
Crested Lark
Red-rumped Swallow
Thick-billed Nutcracker
Wallcreeper
Dusky Thrush
Black-throated Thrush
Alpine Ring Ouzel
Rock Thrush
Desert Wheatear
Western Desert Wheatear
Western Black-eared Wheatear
Eastern Black-eared Wheatear
Isabelline Wheatear
Black Wheatear
North African Black Wheatear
Siberian Stonechat
Thrush Nightingale
White-spotted Bluethroat
Cetti's Warbler
Savi's Warbler
Moustached Warbler
Great Reed Warbler
Eastern Great Reed Warbler
Melodious Warbler
Icterine Warbler
Olivaceous Warbler
Orphean Warbler
Rüppell's Warbler
Sardinian Warbler
Rufous Warbler
Brown-backed Warbler
Dusky Warbler
Brown Flycatcher
Collared Flycatcher
Masked Wagtail
Grey-headed Wagtail
Black-headed Wagtail
"Sykes's" Wagtail
South European Grey Shrike
Lesser Grey Shrike
Corsican Woodchat Shrike
Masked Shrike
Pine Grosbeak
Black-headed Bunting
Rock Bunting
Rustic Bunting
Little Bunting
Western Large-billed Reed Bunting
Eastern Large-billed Reed Bunting
Snow Finch

CLASS II (rarities with 20-99 English examples accepted in *The Handbook*)

Balearic Shearwater
Purple Heron
Squacco Heron
Surf Scoter
Red-footed Falcon
Little Crake
Pectoral Sandpiper
Pratincole
Cream-coloured Courser
Whiskered Tern
Gull-billed Tern
Caspian Tern
Scops Owl
Snowy Owl
Tengmalm's Owl
Slender-billed Nutcracker
White's Thrush
Aquatic Warbler
Barred Warbler
Yellow-browed Warbler
Red-breasted Flycatcher
Alpine Accentor
Richard's Pipit
Tawny Pipit
Red-throated Pipit
Woodchat Shrike
Serin

CLASS III (rarities with occurrences not enumerated in *The Handbook*)

Great Shearwater
Night Heron
White Stork
Glossy Ibis
Red-crested Pochard
Ferruginous Duck
Ruddy Shelduck
Goshawk
White-tailed Eagle
Gyr Falcon
Baillon's Crake
Eastern Little Bustard
Great Snipe
Black-winged Stilt
Red-necked Phalarope
Pomarine Skua
Long-tailed Skua
Iceland Gull
Sabine's Gull
White-winged Black Tern
Roseate Tern
Black Guillemot
Pallas's Sandgrouse
Bee-eater
Roller
Golden Oriole
Chough
British Dipper
Red-spotted Bluethroat
Scandinavian Chiffchaff
Siberian Chiffchaff
Water Pipit
Rose-coloured Starling
Northern Bullfinch
Two-barred Crossbill
Ortolan Bunting

The Hastings Rarities

By E. M. Nicholson and I. J. Ferguson-Lees

CONTENTS

INTRODUCTION

OF THE 520 FORMS (representing 424 species) described in 1941 in *The Handbook of British Birds*, 301 were residents, summer-visitors, regular winter-visitors and passage migrants, or occasional breeders. The rest, the occasional and irregular visitors, were a large class of very varied status and quite a number of them could not be ranked as rarities in the strictest sense. Yet, of this remaining 219, no fewer than 28—just over one eighth—owed their inclusion solely to occurrences reported during 1903-1919 from a small area in east Sussex and west Kent, within roughly a twenty-mile radius round Hastings.

During the fourteen-year period 1903-1916, 49 species and vagrant races were added to the British List. No less than 32 of these were reported from the Hastings Area, as we propose to call it, and five of the remaining 17 had their second records in this district within three to ten years. During 1892-1930 the Hastings Area also accounted for a remarkable number of other records of extreme rarities. From 1919, when the last Hastings addition (the Masked Wagtail*) was accepted, to 1941, when *The Handbook* was completed, only six more species and 18 more races were added to the British List (and several of the latter were regular visitors not previously recognised). Since 1919 the Hastings Area has contributed only two additions, the Audubon's Shearwater (Bexhill 1936) and, recently, the Slender-billed Gull (Langney Point 1960). This in spite of the fact that, with the huge general increase in observers since 1945, the period 1947-61 saw the addition of 28 or more full species in many different parts of the country, as well as the acceptance of a number of new races.

*All scientific names are given in Appendix D on pages 382-384.

In the first issue of *British Birds* in June 1907 the leading authority of that time, Howard Saunders, wrote that the Hastings Area "had not, until late years, received much attention at the time of the spring migration, although it was precisely the district from which remunerative results might have been expected". He attributed the "removal of this reproach" to a number of keen local ornithologists. However, as the number of improbable records increased, more and more doubts about their authenticity were felt and stricter measures for their verification were called for. Naturally many of these doubts went unrecorded, but some were expressed in private correspondence and a few were even published. Some of the more significant contemporary comments, both published and unpublished, are reproduced later in this paper (pages 328-338).

Since then, over forty years of intensive ornithology have added greatly to our knowledge of bird movements and distribution. Improved techniques for assessing the validity of claimed occurrences of rare birds have been developed. More has become known about the meteorological and other conditions in which birds from distant regions may be able to travel to the British Isles, and about the patterns of simultaneous occurrence here of vagrant species involved in different types of movements from different parts of Europe, Asia or North America. Men of science in a number of different fields of interest have also, unhappily, had cause to become sadder and wiser regarding the deliberate misuse of skill and knowledge to secure the acceptance of false records. Our predecessors forty and fifty years back had not the advantage of the comprehensive basis for analysis and judgment which now enables us to be wise after the event. Indeed, the fact that such a basis now exists is largely due to their pioneer efforts by trial and error. To apply this technique retrospectively is a vindication, not a criticism, of their contribution to knowledge. We therefore now propose to re-examine critically what may, for the sake of brevity, be termed the Hastings Rarities.

It is essential in the interests of science to determine how far these records are to be relied upon. Our concern is with the scientific question whether certain hitherto accepted records can reasonably be held to satisfy the modern standards of proof required to justify their continued recognition in ornithological literature. It is not our concern to probe the motives or conduct of any persons living or dead. Recognising the temptations provided for human curiosity by such an analysis, we feel bound to stress the dangers of drawing hasty conclusions, which might well be found to be one-sided and unjust if all the witnesses could be called out of the past to give their full and truthful testimony. Each of us owes a duty to science which is overriding, but also a duty of fairness to all, and particularly to those who are no longer here to take care of themselves. We wish, therefore, to

record our warning against the use of our investigation to seek to fasten any sort of guilt on any person or persons, living or dead.

Such a task as this is not to be lightly undertaken, and we would gladly have declined it if that had been reasonably possible. The uncertainty of these extensive records, which has hung over our ornithological history like a dark cloud for half a century, has, however, so troubled writers on the subject that sooner or later the whole question had to be independently and dispassionately re-examined and resolved by fresh minds, unconnected with any of these matters. Moreover, it was essential that this should be done while witnesses were still alive to help with the inquiries and to answer questions. We have over the past seven years used our utmost endeavours to make contact with, and be informed and advised by, as many as possible of those still living who might be able to help. We are most grateful to those whose memories have not failed to serve them truly over these long-past events, and who have placed their knowledge and, in some cases, their private correspondence at our disposal. As readers will appreciate, the fact that this journal in its early days became one of the main vehicles for recording the Hastings Rarities lays on us a special obligation to carry through this delicate investigation without fear or favour.

DEFINITION OF THE HASTINGS RARITIES

Clearly the first task is to define and list the records that come under consideration. J. A. Nelder's statistical analysis on pages 283-288 takes the Hastings Area as a radius of twenty miles from Hastings Pier, plus the eastern corner of Romney Marsh which it is necessary to include for the reasons he gives (see map on pages 332-333). In fact, however, there is very little evidence of suspicious records south or west of Pevensey and Pevensey Levels. In general, therefore, we have ignored those west of a line from Pevensey and Hailsham through Heathfield and Mayfield in the direction of Tunbridge Wells. (Even this definition of the area is on the generous side and there are actually few Hastings records north of a line from Hythe to Cranbrook and thence to Heathfield. However, for the sake of simplicity, we have adhered to Nelder's boundary with the exception of the westernmost section already mentioned.)

The first suggestion of a Hastings Rarity was in 1892 and the last in 1930 (see Appendix C on pages 374-382). We have therefore listed in Appendix A all the records of unusual species allegedly shot or found dead in the Hastings Area during this period, except for those where there is independent confirmation or other positive reason in favour. Added to these are a few others from outside the area which we know to be connected. Meanwhile, Appendix B lists sight-records—birds said to have been accompanying ones shot or otherwise closely

associated with the Hastings Rarities. In all, there are 542 specimens of 143 species or subspecies in Appendix A, while Appendix B adds a further 55 sight records (not individual birds) which are closely linked.

As there is no accepted definition of a rarity, we have followed Nelder's list of species and races with the exception of the deletions and additions explained in the introduction to Appendix A (pages 348-349). In general, we have not found it necessary to distinguish different degrees of rarity, but in selecting examples for the discussion which follows we have borne in mind Nelder's inevitably somewhat arbitrary division into three classes (page 285). We are primarily concerned with occurrences which were reported at the time to such recognised ornithological journals as *British Birds*, the *Bulletin of the British Ornithologists' Club*, *The Zoologist* and *The Ibis*, and which, having been published in this way, were accepted for *The Handbook*. However, because they form an essential part of the picture, we have included (in square brackets) a number of records which were rejected at the time and a few which were never even submitted. In completing the full list we have found the county avifaunas of Walpole-Bond (1938) and Harrison (1953) quite invaluable; we are particularly fortunate that these two works are far more detailed in their treatment than most regional bird books of their kind.

Apart from showing the boundaries which we and Nelder have used for the Hastings Area, the map on pages 332-333 includes all the localities named in Appendix A, together with a key listing the reference numbers of the individual specimens belonging to each place (sight-records add only one locality and have been omitted from the map). It will be seen that the greatest concentrations are from coastal and near-coastal places, and these fall into two main categories—the flat area of marshland, shingle, mud and sand which includes Pett Level, Winchelsea, Rye, Romney Marsh and Dungeness, and the even then more built-up zone from Hastings and St. Leonards to Bexhill and Little Common. In addition, however, there is a curiously high proportion of records from a hinterland strip some three to six miles inland and centred on a line about ten miles long running roughly from Ashburnham to Brede, with an L-shape extension up to Burwash. About four-fifths of the occurrences fall within these three small sections.

PECULIARITIES OF THE PATTERN

The hinterland group

The most peculiar feature of the whole map is the hinterland group, for it accounts for such rarities as two of the six British specimens of the Black Lark (the others are all Hastings Area records); three of the

six accepted British Thick-billed Nutcrackers in three successive years (two of the other three are also Hastings records); two of six Hastings Slender-billed Nutcrackers; one of six Hastings Dusky Thrushes, there being only one other British record up to 1950; one of the only two British Alpine Ring Ouzels; two White's Thrushes at the same place in successive years; one of the small handful of British records of the Eastern Black-eared Wheatear; all three of the Cetti's Warblers recorded in Britain up to 1950, within a three-mile radius in different years; two of the first three British specimens of the Melodious Warbler (the first one a male reported shot in spring at the same time as a female Icterine); the only two Rüppell's Warblers ever recorded in Britain or, indeed, western Europe; one of the only four English Rufous Warblers in the first half of the twentieth century; two of the four British Brown-backed Warblers (the others are also Hastings records); one (and another seen) of five Hastings Collared Flycatchers, the entire British complement at the time of *The Handbook*; all the British Pine Grosbeaks in the first half of the twentieth century; six Two-barred Crossbills, and at least seven others claimed as seen; two of the six English Black-headed Buntings in *The Handbook* (two of the other four are also Hastings records); three of the six British Rock Buntings up to 1950 and two others not accepted; and four of the dozen English Rustic Buntings (though two of them were not accepted by *The Handbook*).

There were many other species in this hinterland zone—Red-footed Falcon, Little Crake, Black-winged Stilt, Bee-eater, Roller, Icterine Warbler, Red-throated Pipit and Lesser Grey Shrike, quite apart from such rejected records as a Great Spotted Cuckoo and a pair of Belted Kingfishers. The village of Westfield alone accounted for an Eastern Little Bustard, two Black Larks, an Eastern Black-eared Wheatear, a Cetti's Warbler, a Brown-backed Warbler, a Collared Flycatcher (and another seen), a Two-barred Crossbill (and a flock of five seen), and a remarkable run of buntings including a Black-headed, a Rock, and no less than three Rustic in different years. In all, 73 of the records in Appendix A refer to this hinterland. Such a concentration would be outstanding at the most favourable island or coastal bird observatories regularly manned by keen and skilled ornithologists; the occurrence of this number of rare vagrants several miles inland in typical wealden wooded country is so extraordinary that it cannot be matched anywhere, nor is there any recent evidence of rarities being met in this same hinterland to any unusual degree.

On the map, then, it should be noted that not only is there an exceptional list of rarities for the Hastings Area as a whole during this period, but the distribution of occurrences as between inland and coastal sections is so far unparalleled in all the extensive British records of bird migration.

The coastal groups

The concentration in the immediate Hastings-Bexhill built-up area is also remarkable. This might conceivably be attributable to exceptional vigilance, combined with the existence of centres of intense attraction which have not survived, but even so the list of exotic birds is still extraordinary. There are actually very few records for Hastings and Bexhill themselves, but St. Leonards and the various suburbs or adjacent villages of Cooden, Little Common, Bulverhythe, Filsham, St. Helens, Ecclesbourne, Fairlight and especially Hollington (which is two miles from the sea and might almost be ranked with the hinterland group) account between them for 93 of the rarest.

These included two Wilson's Petrels, one of which and a Madeiran Petrel were never accepted; three of the dozen British records of Little Shearwater up to 1950, including one of the only two of the Cape Verde race (the other was also in the Hastings Area); the only accepted British specimen of the North Atlantic Shearwater; one of four Hastings records of Bulwer's Petrel, which together make up more than half the British total; one of the ten British Lesser Kestrels; an Upland Sandpiper; two Slender-billed Gulls and two Noddy Terns which were never accepted for the British List; a fairly wide range of other gulls, including Great Black-headed, Mediterranean Black-headed (then a much rarer bird in British waters), Bonaparte's and Sabine's, several of which were not accepted; all the pre-1950 Calandra Larks (two obtained and three others seen); an Indian Golden Oriole, not accepted; one more Thick-billed Nutcracker; two of the seven British specimens of Wallcreeper recorded in *The Handbook*; the other five Dusky Thrushes already referred to in the last section; two Western Black-eared Wheatears; one of the five British Isabelline Wheatears (three of the others are also Hastings records); a splendid collection of warblers including Savi's, the only British specimen of Moustached, three Great Reed and the only British record of Eastern Great Reed, Aquatic, Icterine, the only three British Olivaceous Warblers in *The Handbook* (two of them not accepted), three of the five British specimens of Orphean, the only British Sardinian up to 1950, one more of the only four British specimens of Brown-backed (and another not accepted), a Yellow-browed and one of the only two British records of the Dusky Warbler up to 1950; two more of the five Hastings Collared Flycatchers; a party of three Alpine Accentors, not accepted; two more Red-throated Pipits; the only British Masked Wagtail; three Long-tailed Rose Finches which were never accepted for the British List; and, among buntings, another Black-headed, two Rustic (not accepted) and one of the only two British records of Western Large-billed Reed (the other is also a Hastings Area bird). And all these were in a coastal strip only ten miles long and lacking any promontory or other area of concentration.

The other big coastal concentration—in the Winchelsea-Rye-Romney Marsh area (records for the last locality referring mainly to what is now known as Walland Marsh)—is more consistent with subsequent and general experience, in that this district still produces a large and varied selection of unusual waders and other aquatic birds. Even so, however, the number of extreme rarities is remarkable. A second marshland area has to be considered at the same time because some of the rarest species were equally divided between the two: this is the part round Pevensey and Wartling, on the other side of the Hastings-Bexhill strip. The following summary of the most unusual records in these two zones is highly selective and so its length is all the more remarkable.

Taking Rye-Romney and Pevensey together, then, we find that the tube-noses included two more Madeiran Petrels; four more Madeiran and two more Cape Verde Little Shearwaters, among them one of each for the same day and place (these two were rejected); two Mediterranean Shearwaters, one of them the only British record accepted in *The Handbook*; two more North Atlantic Shearwaters, one of them rejected; and the other three Bulwer's Petrels. Among the waders were no less than eight Sociable Plovers obtained from flocks of six, five and three (there were only four other British records up to 1950); the only British record of Semipalmated Ringed Plover; six or seven Killdeers, half the British complement up to 1950; three of the four British specimens of Caspian Plover; one American Golden Plover, the second British record; ten or more Asiatic Golden Plovers from two flocks (there are only three other British records in *The Handbook*); all six British Slender-billed Curlews, the first three being from a "small flock"; half the seven British Solitary Sandpipers listed in *The Handbook* and five of the eleven Spotted Sandpipers (plus three others not accepted); the only two British Grey-rumped Sandpipers; all seven British Terek Sandpipers up to 1950; three of the five British Baird's Sandpipers in *The Handbook*; the only British Semipalmated Sandpiper up to 1950; a Wilson's Phalarope which would have been the first British record if it had been accepted; and seven of the eight English records of Black-winged Pratincole; quite apart from a string of such birds as Dowitcher, Upland Sandpiper, Greater and Lesser Yellowlegs, Marsh Sandpiper, White-rumped Sandpiper, Pectoral Sandpiper, Broad-billed Sandpiper, Pratincole and Cream-coloured Courser. There were Great Black-headed Gulls and Whiskered Terns, and a Royal Tern which would also have been the first British record if it had been accepted. Among Passerines, we find the remaining four British specimens of the Black Lark, with several others claimed as seen; a series of White-winged Larks; one of the only four Red-rumped Swallows in *The Handbook*; two of the eight or so Rock Thrushes recorded in Britain; a wonderfully representative

selection of assorted wheatears, including Western Desert (not accepted), Eastern Desert (one of the only two British), Western Black-eared (six), Eastern Black-eared (three), Isabelline (three of the five British), Black (the only two British specimens) and North African Black (the only British); astonishingly few warblers (considering their prevalence in the Hastings-Bexhill strip and the hinterland there); the only British specimen of the Brown Flycatcher and the remaining two Collared Flycatchers; the only British records of Tawny Pipits and Aquatic Warblers breeding (the latter never accepted); the only British records of three shrikes, South European Grey, Corsican Woodchat and Masked; the other Western Large-billed Reed Bunting and the only Eastern Large-billed; and four of the only six British specimens of the normally very sedentary Snow Finch, the other two also being Hastings birds. No less than 317 of the specimens in Appendix A were stated to have come from Rye-Romney and Pevensey.

The composition of the list

Considering the composition of the list as a whole, there are certain puzzling features. Comprehensive as it is, it shows remarkably few really large and conspicuous species such as herons, storks, ducks, geese, grebes, owls and larger birds of prey, which might have been expected to be favourite targets for such a large and uninhibited band of year-round gunners as is indicated by the bag in general. It is also surprising that there should be so few records of semi-rarities which are known to have occurred along the Channel coast for many years and indeed still do so, such as the Black-winged Stilt, Bee-eater, Golden Oriole and Aquatic Warbler. Among species which do not occur in Appendix A, there seem to be no records of Ortolan Buntings in the Hastings Area during the period concerned, which is remarkable when one considers the number of these birds recorded further west in Sussex and when one bears in mind that buntings were a Hastings speciality. Similarly, there are only eight Hastings records of the Bluethroat, apart from the four of the White-spotted form which appear in Appendix A; and the numbers of Firecrests and Hoopoes, for example, are low in proportion to the real rarities.

Looking at Appendix A, one is immediately struck by the fact that the first twenty-seven birds are all rare or extremely rare petrels and shearwaters, mostly "washed ashore" or "found dead". One might conclude from this that there are exceptional onshore currents on this part of the coast, or that the beaches were diligently combed for interesting sea-birds thrown up by the tide. It is rather revealing, therefore, to find that the total of the seven rarest forms in Appendix A —Wilson's Petrel (two), Madeiran Petrel (three), Madeiran Little Shearwater (five and probably a sixth), Cape Verde Little Shearwater (three), Mediterranean Shearwater (two), North Atlantic Shearwater

(three), and Bulwer's Petrel (four)—exceeds by two the total combined of Leach's Petrel (three), Storm Petrel (two), Manx Shearwater (three), Great Shearwater (three), Balearic Shearwater (one), Sooty Shearwater (five) and Fulmar (four), the seven commonest forms in British waters. Many other anomalies of this kind might be pointed out—the total absence from the list of the Purple Heron, normally more frequently recorded than either Squacco or Night Heron, to take but one example.

It might also have been expected that the Hastings Area would have contributed more prominently to records of irruptions or invasions such as that of Pallas's Sandgrouse. In 1908 this species reached Kent, Hampshire, Surrey, Berkshire, Hertfordshire, Essex, Norfolk, Yorkshire and Cheshire and three were seen by H. G. Alexander on 4th July that year at Littlestone, actually within the area—yet none was collected.

It should also be noted that the list of birds in Appendix A is predominantly Mediterranean, North African, south-east European and to some extent south Asian in character. Continental and northern species play a very small part. In fact, the Hastings Rarities do not appear to represent, as one might have expected, a particularly lavish random sample of the more unusual birds occurring in the area at the time, since many semi-rarities which almost certainly must have passed through were for some reason not included in the recorded bag.

Irruption species

Some species now known to occur almost exclusively as a result of peculiar and infrequent dispersals on the Continent were recorded at periods more or less inconsistent with such movements. The Pine Grosbeak, for instance, is almost entirely an irruption species in European countries bordering the Atlantic. Between 1890 and 1930 there were only two really large-scale irruptions of this bird into southern Sweden and Denmark, the first in 1890-91 and the second in 1918-19, though in 1923-24 the species was abundant in central Sweden. In the first of these three winters one reached Nottinghamshire, but there were then no other British records until 1954—apart from a number in the Hastings Area. None of these Hastings birds was in any of the three peak years just mentioned. Instead, a small flock was stated to have reached Kent and Sussex in October 1905, in which winter the only record substantially south-west of the normal range was an odd bird in Denmark in March 1906. Two were also claimed for Kent in March 1909 when there were no records in southern Sweden or Denmark, and two more in January 1914 when only one small flock was noted even in south Finland. The last Pine Grosbeak, claimed for Sussex in February 1917 but not admitted to *The Handbook*, falls in a two-year period when Scandinavia recorded no movements at all.

An even more curious problem is presented by the Hastings records of the Nutcracker. This species has two clearly-marked races, one of which—the Thick-billed (*N. c. caryocatactes*)—breeds as close to Britain as Switzerland, east France and Scandinavia but rarely wanders, while the other—the Slender-billed (*N. c. macrorhynchus*)—breeds much farther away in Siberia and north-east Russia but not infrequently irrupts in winter south-westward as far as the Pyrenees; thus the latter crosses the range of its relative and is therefore, as is now known, far more likely to occur in Britain. In the early years of this century, however, a succession of Thick-billed Nutcrackers was recorded from Sussex and Kent, beginning with one near Chichester in 1900 and going on with two in 1905, one each in 1907 and 1908 and one or two in 1909—all except the original bird being from the Hastings Area. Apart from a century-old Cheshire record, all Thick-billed Nutcrackers admitted by *The Handbook* are Kent-Sussex records in the years 1900-1909 when they occurred almost annually after 1904. As Bannerman (1953) commented, "it is not surprising that so few have been identified in Great Britain, oddly enough in Sussex and Kent".

Of the more migratory Slender-billed race, neither Kent nor Sussex yielded any record this century until 1911 when there were three, followed by two more in 1912 and others in 1914, 1923 and 1924. Two of the first three of these were outside the Hastings Area, in which, therefore, every Nutcracker this century up to December 1911 was Thick-billed and every Nutcracker from 1912 onwards was Slender-billed. The year 1911 was marked by a conspicuous invasion of Europe by this latter form which drew much attention to the true position (there had also been smaller invasions in 1900 and 1907, when the Sussex records were not of this race).

Sedentary species and subspecies

By no means all the Hastings Rarities belong to migratory or nomadic species and races. One, the Masked Wagtail, has not otherwise occurred outside Asia. Several, such as the Snow Finch and the two Thick-billed Reed Buntings, are extremely sedentary in their distant habitats. Quite a few more, like Rüppell's Warbler and the Masked Shrike, have no other records north of the Mediterranean region. If we are to appreciate the Hastings picture to the fullest extent, in fact, the part played by Mediterranean, North African and Asian *subspecies* cannot be over-emphasised. Apart from the wagtail and the two reed buntings already mentioned, the Hastings subspecies include such birds as the North African race of the Black Wheatear, the Eastern race of the Great Reed Warbler (which breeds in south-east Siberia), the Brown-backed race of the Rufous Warbler (Balkans and Asia Minor), the South European race of the Great Grey Shrike and the Corsican race of the Woodchat, none of which have otherwise

been recorded anywhere near as far north and west. Among Hastings subspecies which were never accepted we find Egyptian Black Kite, Indian Golden Oriole, Indian Stonechat and Siberian Stonechat, while the following paragraph from a letter sent us by the late Alfred Hazelwood on the subject of a Hastings Area bird in the Bolton Museum is doubly revealing, both on this count and because it provides our first demonstration that the published records are not exhaustive:

> I have discovered another Lydd bird, a Little Ringed Plover with the date 21/5/12. This was not apparently put forward and would be the first Kentish example. As it is certainly the Indian form, *jerdoni*, this would be a most remarkable thing. Bird mounted from a skin, without any doubt, as the neck-skin has split on drying in a way quite typical of such a job.

This blend of forms which are inherently most unlikely to reach Britain in a wild state—some of them, indeed, are not otherwise known ever to have approached within several hundred miles—introduces a difficulty different in kind from that represented simply by an exceptional concentration of occurrences of known vagrants.

Seasons, years and multiple occurrences

These are subjects which have been very thoroughly covered by Nelder in his statistical analysis and it remains for us merely to cite one or two special examples and to draw the reader's attention to the information set out in the appendices.

First, the systematic analysis of the Hastings records, as in Appendices A and B, tends to obscure the chronology and grouping of the actual occurrences. We have therefore devised Appendix C which lists them by years and months as they were actually recorded. Careful consideration of this appendix will illustrate the distinctly unusual seasonal distribution already shown by Nelder's analysis; in several respects it is quite contrary to the type of bunching which we have come to expect through experience of many influxes of unusual birds to Britain. It will also be noted from Appendix C that, while certain years were outstanding, there was a tendency for the occurrences to reach successively higher peaks up to 1914-16 and then to tail off to levels not nearly so remarkable compared with other areas. This tendency is shown even more clearly by Fig. 1. The significance of the build-up and collapse will be discussed later.

Turning now to the question of multiple occurrences, this is one of the most extraordinary features of the Hastings pattern. While a few rarities such as Glossy Ibis and irruption species habitually appear in parties, it is most unusual for Passerines far off their usual course to do so and extralimital waders normally also occur singly. The parties of Lesser Short-toed Larks in south-west Ireland in 1956 and 1958 (*Brit. Birds,* 53: 241-243) are perhaps the only recent instances affecting an addition to the British List or any other extreme rarity. Yet a

glance at Appendix A, where birds allegedly found in pairs or parties are linked by connecting brackets, will illustrate the astonishing prevalence of groups among the Hastings Rarities. The Sociable Plovers, for example, were said to have been obtained from flocks of six, five and three, the Killdeers from two parties of three each, the Asiatic Golden Plovers from two larger groups, the first three Slender-billed Curlews from a "small flock", and the Terek Sandpipers and Black-winged Pratincoles similarly from small parties. Likewise, in the case of the larks, the only British record of the Calandra Lark up to 1960 involved two shot from a party of five near St. Leonards in 1916; the only British records of the Black Lark concerned two parties in the Hastings Area in 1907 and 1915; and the majority of British records of the White-winged Lark were also provided by three small flocks in this part of England in 1902, 1907-08 and 1916. Note too the "party" of at least six Dusky Thrushes in early 1915.

The occurrence of males and females together as vagrant pairs is, according to modern experience, even more peculiar, particularly among adults in spring. Yet at one time it was thought that migrating birds probably travelled as couples and it is most remarkable to note how many of the double records linked together in Appendix A refer to a male and a female. In one instance already mentioned, two warblers were stated to have been shot together in the same Sussex garden in April 1897, but the male proved to be a Melodious and the female an Icterine and we find ourselves forced uncomfortably close to the limits of credulity, particularly as these two species largely replace each other geographically and are seldom found together even

FIG. 1. Annual totals of the Hastings Rarities. Only the specimens in Appendix A on pages 348-373 are included in this graph. Note the sharp drop after 1915, which is discussed on pages 327-333 (*drawn by Robert Gillmor*)

in autumn (the normal time for their occurrence in Britain). No less hard to swallow, even though the birds concerned were of the same sex, is the case of the Madeiran Little Shearwater and Cape Verde Little Shearwater which turned up together at Jury's Gap on 9th March 1933, while a Pratincole and a Black-winged Pratincole in the same general area in May 1903 also seem curious.

Summary

Summing up this section in conjunction with Nelder's analysis, we find that the Hastings Rarities show many improbabilities, both in the mass and in detail, which make them inconsistent with the main body of observations of vagrant birds in Britain, including those made subsequently in the same area. Indeed, their peculiarity is such as to call for the most rigorous proof and explanation if their authenticity is to be reaffirmed.

COMPARISON WITH CURRENT EXPERIENCE

After the initial analysis had been made, comparing Hastings and other records for the first and second quarter-centuries, it became apparent in the 1950's that the greatly increased cover of observers, the operations of bird observatories and other new factors were bringing about a multiplication of unusual records which might well change our entire perspective on the frequency and distribution of such occurrences in Great Britain, and possibly affect the framework of criticism of the Hastings Rarities. As explained in an editorial in *British Birds* (52: 241), the flood of records had by 1958 swamped the system for dealing with them; in that autumn alone, for example, more than four times as many Melodious Warblers were reported as in all British ornithological history up to *The Handbook*.

This situation was met by instituting an annual rarities report covering nearly two hundred species of least frequent occurrence (and also certain others outside their normal British range, but these are not relevant here). In 1958 there were already some 370 observations of these species to be considered; in 1959 the figure had risen to 430 and in 1960 there were over 500 (Pyman 1960a, 1960b, 1961). This annual national report, which is most carefully and authoritatively sifted, constitutes a more comprehensive and reliable continuous survey of the occurrences of rare birds than has ever previously been available; and, although it is still evidently affected by differing densities of observer cover, the presence within the Hastings Area of one of the leading bird observatories and of many active ornithologists may safely be assumed to ensure that the total of rarities there is not now depressed by any relative inadequacy of observation.

It is accordingly interesting to analyse the results for the first three years under the new system. In 1958 only nineteen (just under ten

per cent) of the listed rarity species were represented by one or more individuals in Kent and Sussex as a whole, and a mere seven of them in the Hastings Area in its wider sense (including Eastbourne and Beachy Head); in 1959 the corresponding totals were twenty and eleven, and in 1960 they were twenty-four and eleven. For the twenty species concerned (listed below) the Hastings Area's share of the total British and Irish records in these years ranged between one out of two (Greenish Warbler 1959) and one out of twenty (Pectoral Sandpiper 1959), with two exceptions (Black Stork 1958, Slender-billed Gull 1960) in which a Hastings Area record was the only one of its year. Only one of the five species added in this period to the British List occurred in or near the area, and that was the Slender-billed Gull at Langney Point near Eastbourne. The following is a list of the rarity species in the Hastings Area (still in its wider sense) during the three years 1958-60:

Purple Heron (1958, 1960)
Little Egret (1958)
Black Stork (1958)
Ferruginous Duck (1960)
Red-footed Falcon (1959)
Pectoral Sandpiper (1960)
Black-winged Stilt (1958)
Slender-billed Gull (1960)
Mediterranean Black-headed Gull (1959, 1960)
Sabine's Gull (1959)
White-winged Black Tern (1960)
Gull-billed Tern (1958, 1959, 1960)
Great Reed Warbler (1959)
Aquatic Warbler (1959, 1960)
Melodious Warbler (1958, 1959, 1960)
Icterine Warbler (1959, 1960)
Greenish Warbler (1959)
Tawny Pipit (1958, 1959, 1960)
Woodchat Shrike (1959).

Of these nineteen species, the Little Egret, Black Stork, Ferruginous Duck, Red-footed Falcon, Pectoral Sandpiper, Sabine's Gull, White-winged Black Tern, Great Reed Warbler, Greenish Warbler and Woodchat were represented by a single individual over the three years, and the Purple Heron by a single individual in each of two years, making eleven species of which not more than one was seen in any year. Of the remainder, the Aquatic and Icterine Warblers both had two in one year and one in another (all but one Aquatic trapped at Dungeness), and the Melodious Warbler was trapped once in each of the three years. In September 1958 there were three Black-winged Stilts reported. The Gull-billed Tern, recorded once each in 1958 and 1959, occurred on three occasions in 1960, twice singly and once three, and the Mediterranean Black-headed Gull had two singles in 1959 and one in 1960. The Tawny Pipit, after one in 1958 and one in 1959, occurred on five days in 1960 with a maximum of at least four different birds on 17th September.

The distribution of these occurrences shows none of the surprising multiple groups recorded early in the century and their seasonality is also perfectly in accord with the normal, about sixty per cent being during the autumn migration (of the eleven rare warbler occurrences,

ten were in autumn and only one in spring). The months of occurrence of individuals were:

January	0	July	3
February	0	August	6½
March	0	September	20½
April	2	October	1
May	4	November	½
June	4	December	½

(Individuals seen in two months are counted ½ in each)

We now consider what part these species played in the Hastings picture between 1892 and 1930. Here we must not confine our attention to the Hastings Rarities which are listed in Appendix A and Appendix B; for a proper comparison all the birds shot or seen in the Hastings Area during that period have to be included. Taking these nineteen species, then, we find that there were no records at all of Little Egret, Black Stork or Greenish Warbler in the Hastings Area during those thirty-nine years, and the only two Slender-billed Gulls were not accepted. Totals of individuals for the other species were Purple Heron 3, Ferruginous Duck 12, Red-footed Falcon 11, Pectoral Sandpiper 13, Black-winged Stilt 9, Mediterranean Black-headed Gull 12, Sabine's Gull 5, White-winged Black Tern 16, Gull-billed Tern 3, Great Reed Warbler 4 (including one of the Eastern race), Aquatic Warbler 14+, Melodious Warbler 2, Icterine Warbler 10, Tawny Pipit 23 and Woodchat Shrike 11 (including one of the Corsican race).

With one or two minor exceptions there is a reassuring correspondence over the totals for these species, allowing for changed conditions. They provide no indication, so far as they go, of any dramatic alteration in the incidence of their occurrence in the Hastings Area since the beginning of the century. Such difficult species as Icterine and Melodious Warblers are currently being detected in the Hastings Area at a higher annual rate than during the period of the Hastings Rarities. The same applies to the Purple Heron, Black-winged Stilt, Gull-billed Tern, Aquatic Warbler, Tawny Pipit and Mediterranean Black-headed Gull (though the last may well be due to an increase in range). While too much reliance cannot be put upon short periods, such an increase is quite consistent with a pattern of regular occurrence in small numbers and of a simultaneous growth, possibly of the order of four or five times, in the effectiveness of local observation. The results of intensive watching and trapping in the Hastings Area today tally quite closely with the more fragmentary records of watching (as distinct from "examining in the flesh") by such good observers as H. G. Alexander, N. F. Ticehurst and the late Duchess of Bedford during the early years of the century. But these continuing visitors are all second or third-class rarities except (in pre-1920 terms) the Mediterranean Black-headed Gull and the Melodious, Icterine and

Great Reed Warblers, and even they are of annual occurrence now.

While comparison of modern records with those of the same species during the Hastings Rarities period gives a reasonably good fit, an attempt at the reverse comparison offers a diametrically opposite result. There is simply no fit at all. The various rare petrels and shearwaters already discussed, the fifteen Sociable, six Killdeer, three Caspian and twelve or more Asiatic Golden Plovers, the six or more Slender-billed Curlews, the four Solitary, eight Spotted, five Marsh, two Grey-rumped and seven Terek Sandpipers, the seven Black-winged Pratincoles, the five Cream-coloured Coursers, the dozen or more Black, five Calandra and eleven White-winged Larks, the six Thick-billed and seven Slender-billed Nutcrackers, the three Wallcreepers, the six or more Dusky, two Black-throated, three White's and two Rock Thrushes, the fourteen Black-eared, five Isabelline and three Black Wheatears, the three Cetti's, one Moustached, three Olivaceous, three Orphean, two Rüppell's, one Sardinian, one Dusky, one Rufous and five Brown-backed Warblers, the one Brown and six Collared Flycatchers, the four Alpine Accentors, the Masked Shrike, the ten or more Pine Grosbeaks, the fourteen or more Two-barred Crossbills, the five Black-headed, five Rock and six Rustic Buntings, and the six Snow Finches exemplify the type of outstanding rarity for which we look in vain in the modern Hastings list.

Indeed, it is evident that on the strength simply of those rarities which can be corroborated from later experience, the Hastings Area has no claim to be regarded as exceptionally favoured. For example, in 1958, compared with the Hastings list for that year given above, the far less extensive Isles of Scilly recorded an American Purple Gallinule and a Northern Waterthrush, both new to the British List, and also a Short-toed Lark, a Subalpine Warbler, a Black-headed Bunting and a Little Bunting, in addition to sharing with Hastings the Purple Heron, Melodious Warbler and Tawny Pipit.

To take another area and another year, in 1960 Fair Isle recorded five Short-toed Larks out of eight for Britain, two Lanceolated Warblers out of two, one Greenish Warbler out of four, one Arctic Warbler out of two, eleven Yellow-browed Warblers out of twenty-one, four Red-throated Pipits out of four, one Yellow-headed Wagtail out of one, one Lesser Grey Shrike out of three, one Red-tailed Shrike out of one, one Rose-coloured Starling out of two, five Scarlet Grosbeaks out of eight, two Rustic Buntings out of four and six Little Buntings out of eight, in addition to matching the Hastings figures for Aquatic and Icterine Warblers. And we must remember that, unlike Hastings, Fair Isle is able to show for its particular and highly characteristic range of specialities a very satisfactory degree of similarity with records of fifty years ago, taking into account the greater intensity of modern observation and trapping.

Comparison even with neighbouring parts of the coast of southern England is far from favourable to any claims of the Hastings Area for attracting outstanding numbers of rarities. In 1959, for example, a much more restricted area from Langstone Harbour to Pagham Harbour in Sussex recorded Little Egret, Red-crested Pochard, Little Crake, Long-billed Dowitcher, White-rumped Sandpiper, Pectoral Sandpiper, Mediterranean Black-headed Gull, White-winged Black Tern and Aquatic Warbler. Areas in east and north Kent could also readily match the present-day Hastings occurrences. It is now quite clear that a number of districts of comparable or smaller size regularly outclass Hastings, especially in the matter of extreme rarities, while many others appear no less favoured. At the same time no district is now relatively as outstanding as Hastings was made to appear in the early part of the century, and all the leading localities for rarities have better-defined and readily explicable characteristics in their regular pattern of visitors.

Here, then, a dilemma presents itself. If we can find no general presumption against the authenticity of that minority among the Hastings Rarities which still recur, then the rest, far from having ceased, ought now to be appearing four or five times as frequently as during 1892-1930, as a result of the improved observation of the area. Their failure to do so presupposes either that there has been some abrupt change in migratory conditions affecting many birds originating in such different regions as east Asia, North Africa, the Mediterranean, the Alps, Arctic Europe and North America, yet not affecting the species common to the first two decades of the century and the present day, or, alternatively, that as a group the records which are not now corroborated are, in fact, not genuine. We can see no logical or factual grounds for preferring the former of these hypotheses to the latter.

One possible argument which might be advanced is that, while some of the species first added to the British List as Hastings Rarities remain wholly dependent for their places on those records, others have since been properly verified elsewhere in Britain. Admittedly in a few instances, such as the Cetti's Warbler and Calandra Lark, there is now independent confirmation of what appeared improbable occurrences. Even under the laws of chance, however, a proportion of such cases might be expected and, since the process which placed the Hastings Rarities on the British List was evidently subject even at the time to a fair amount of scrutiny and to certain limits of credulity, it is not surprising that some of the species represented were potentially capable of finding their way here. It must never be overlooked that the problem is not merely to discover whether these records could have been genuine, but to establish whether they can still be accepted as reasonably well proven.

In contrast to most modern records, the Hastings Rarities are very largely based on skins rather than on descriptions of birds sighted or trapped and released. Indeed, disregarding birds which were reported seen and subsequently shot, or their companions in flocks or parties, only about eighty (or twelve per cent) of the records for the area between 1892 and 1930 are simply sight records and the majority of those are second- or third-order rarities. These sight records may be classified into those which, with suitable allowance for conditions and practice at the time, can be regarded as substantiated both by sufficient confirmatory detail and by knowledge of the competence of the observer, and others which do not begin to fulfil even the first of these conditions and which would not now be regarded as acceptable or, indeed, qualify for serious consideration on the basis of the information provided.

It is necessary to recapitulate briefly here what are the current requirements as evidence of occurrences of rarities. Notes taken on the spot are the basic essential. These may be put into order subsequently, but must not be added to after reference to books. They should include not only a detailed description of the bird's whole plumage, bill and legs, shape, size in comparison with other species present and any call-notes uttered, but also remarks on the distance at which it was seen, whether binoculars were used, the nature and direction of the light, the type of ground it was on and its reaction to this habitat, its behaviour, how it flew, whether it seemed tame or wild, whether the observer has any previous experience of the species, and so on. Experience in checking such reports has made it easier for both county and national committees to separate genuine records of birds that have really been seen from ones that have been touched up by reference to books.

Accuracy of description in itself is not everything, therefore, in the case of sight records. For example, an unusually detailed description of a White-winged Lark near Rye on 3rd November 1915 (*Brit. Birds*, 9: 209) shows a disturbing echo of the wording of the then standard text-book by Howard Saunders. This particular record is of special interest because, according to its label, a White-winged Lark in Haslemere Educational Museum was shot at Rye a week later, but if the date is correct it was never recorded. Why this should be so remains a mystery, for it would have tended to confirm and draw confirmation from the sight record. At least it will serve as a reminder that the normal publications on which we must rely in listing the Hastings Rarities are far from forming an exhaustive catalogue. While a few of the apparently unrecorded specimens still in existence may be those of recorded occurrences confused by odd discrepancies in dates and localities, there are undoubtedly some, perhaps

many more, which were mounted and sold to collectors without any attempt to place them on the record. To that extent, therefore, what is said here about the improbability of so many rarities occurring together tends to understate the position. The fact that such specimens were sold to collectors without their authenticity being submitted to verification also raises the question why this familiar and essential procedure was observed in some instances but not in others.

It is, however, only a small minority of the Hastings Rarities which are linked in any way with sight records (a mere 66 of the 542 specimens in Appendix A are connected with sight records in Appendix B). Indeed, one of the most mystifying aspects is the chronic lack of fortune among expert ornithologists in seeing alive any significant fraction of the exciting rarities whose corpses were being so efficiently and profusely collected and brought in by gunners from a couple of dozen or so parishes. Out of the 485 Hastings specimens which were accepted, not more than about sixteen are even stated to have been seen wild and free by any ornithologist about whom anything is known. Worthwhile details of any sort are preserved in only two or three of these cases, not including a single one involving the addition of a new bird to the British List. Here is a vital point calling for careful reflection. It means that the most important series of rarities to be recorded in Britain this century, or indeed in any two decades in so small an area, went virtually unwitnessed and unverified so far as field ornithology (including field collecting by ornithologists) was concerned. First-rate ornithologists such as the late E. C. Arnold and Dr. N. F. Ticehurst and H. G. Alexander never found or were shown in the field any of the really outstanding rarities. Indeed, although Arnold was resident in the Hastings Area (in its wider sense) and although he was outstandingly skilful in pursuit with the gun—he was personally responsible for two of the twenty additions to the British List between 1899 and 1907 which Howard Saunders listed in the first issue of *British Birds*, but they were both in Norfolk—he contributed nothing significant to the list of extreme rarities which was being built up there in his time.

Who, then, were the brilliant collectors who succeeded so spectacularly year after year where some of the best ornithologists of the day were failing? Here we encounter an even deeper mystery. These men, the last survivors of whom should still be living, remain almost entirely anonymous and we have failed to trace them by enquiries locally. The market gardener at Westfield who was sufficiently keen and skilful to obtain two Rüppell's Warblers and a Cetti's within a couple of years remains a nameless and forgotten man. The same is true of the collector of the only British specimen of the Sardinian Warbler (not C. B. Ticehurst, as stated by Bannerman 1954), who received only

indirect mention in the terse phrase "it had been killed the day before in a bramble bush". Reticence can hardly go farther than in the cryptic phrases "were shot", "were brought in", "was picked up", which are often the only reference, and that usually at second or even third hand, to the all-important point on which the title of the specimen to rank as genuinely British must hang. Occasionally the recorder with greater frankness discloses that "the man who shot the bird thought" or "I happen to know the man who shot them, and am quite satisfied with the result of an interview I have had with him on the subject", or (in the case of an Upland Sandpiper) "Thinking it was a Snipe, the man gave it to a publican". In the case of the Dusky Thrushes, no less than six were brought in from "certain clumps of hawthorn" near Hastings over a period of nearly six weeks without, apparently, any local ornithologist having even gone to look at them.

Only 70 of the 542 specimens in Appendix A have any name of shooter or finder mentioned: eleven of these are M. J. Nicoll and four G. Bristow, but only 13 of the remainder have more than a surname and most of those are such common and untraceable ones as Sargeant, Clarke, Mills and Miller. In fact, despite enquiries, we have not been able to trace and interview any of the people concerned, nor with certainty any members of their families. Indeed, it would not be an exaggeration to say that we have yet to find any evidence that most of the men implicitly credited with finding and collecting the majority of the Hastings Rarities ever existed. If they did, they must have been remarkably modest and self-effacing to obtain all these difficult birds which the most skilled ornithologists have been unable to discover either at the time or since, and to forgo all the credit and interest and much even of the commercial profit of their astonishing harvest, which could scarcely have been permanently concealed from them. No doubt the illegality of some of the collecting gave grounds for discretion, but penalties were then so low and enforcement so much a dead letter that this can hardly have weighed seriously. Comparison with other areas where rarities were much shot, such as Norfolk and Fair Isle, merely serves to throw into relief how extraordinary was the veil of silence which was deliberately and tenaciously hung for so many years over those whose prowess out of doors is presumed to have made possible the Hastings Rarities.

PRICES AND COLLECTIONS

It is necessary at this point, as the background has changed so greatly since the early years of the century, to remind the reader how important a part was at that time played by commercial dealings in stuffed birds and in eggs. In the absence of good binoculars, field identification books, local bird reports and the other requisites of present-day ornithological recording, it was practically essential for a rarity to be

shot and its skin preserved, and the fashion was for it to be stuffed and exhibited in a collection. Some leisured amateurs such as E. T. Booth had an infallible means of vouching for their specimens. "He never allowed a specimen into his collection unless obtained by himself personally; and he collected only in Britain." A number of equally wealthy but less conscientious and experienced collectors acquired their "British-taken" specimens by purchase, usually through taxidermists, and, as in all collecting, their keenness for the rare or unique and their mutual rivalry forced prices higher and higher, straining the sources of supply. One of the best-documented, although extreme sidelines of this activity, was the fierce competition for authentic skins and eggs of the extinct Great Auk. In 1911 Thomas Parkin, a respected and much-liked leader in Hastings naturalist circles, wrote a special 36-page illustrated supplement to the *Hastings and East Sussex Naturalist* with a frontispiece of the sale at J. C. Stevens' Auction Rooms on 7th June 1910 of a Great Auk's egg for 250 guineas. In it he referred to these auction rooms as "so well known to ornithologists, oologists and collectors of objects of Natural History", and he mentioned that another prominent Hastings collector, J. B. Nichols, had in 1902 paid no less than £315 (about £1,320 in current currency) for a mounted Great Auk.

Once men living in such a world and disposing of such resources began to compete with one another for the best collection of British-taken (and even Sussex-taken) rarities it is quite obvious that great temptations were offered to those supplying their wants. Although the sums paid were, of course, immensely less than for a Great Auk, they were still attractive and as early as 1889, just prior to the period under review, members of the Southerden family shot two Spoonbills, one of which was bought for £7 by Mr. Gray of Dover (B. Alexander, *Zoologist,* 1896: 252). Colonel R. Meinertzhagen has written us that £5 was commonly paid for specimens of rare birds and in 1956 H. F. Brazenor, Deputy Director of Brighton Art Gallery and Museum, informed us that fifty years ago there were several wealthy collectors who would give up to £10 for rarities or unusual plumage variations. G. des Forges tells us that the figure was sometimes even as high as £25.

Perhaps the best-informed source on this aspect is the Fifth Edition (1927) of E. T. Booth's *Catalogue of Cases of Birds in the Dyke Road Museum, Brighton,* which was edited by the late A. F. Griffith, a Brighton solicitor who knew intimately both the area and most of the personalities, and who had critically examined a considerable number of the skins of the Hastings Rarities which had found their way to the Booth Museum. The picture given by Griffith's introduction to this catalogue is disturbing:

> The path of a collector of British-killed British birds is beset with many pitfalls.

He has first to decide whether a species is British and next whether any particular specimen is a genuine British example, or whether it has escaped from captivity or may even be a foreigner, passed off as British by an enterprising dealer.

And again:

The late Sir Vauncey Harpur Crewe, who died in December 1924, spared no expense in acquiring varieties and rare species for his collection, but unfortunately took much less care in testing the genuineness as British of the rarities offered to him; and the high prices he was prepared to pay without close investigation offered a great temptation to dealers, so that many of the birds he obtained as British-killed are of very doubtful authenticity.

A few pages further on, in a review of the history of the Booth Museum collection, Griffith listed a number of specimens obtained from the Harpur Crewe collection after the death of Sir Vauncey in December 1924. Many of these had not previously been recorded and quite a few he regarded as "not authenticated". Among the last were several Hastings Area birds, including a Great Black-headed Gull of 1911, two Slender-billed Gulls of 1914, a Great Spotted Cuckoo of 1918, a pair of Belted Kingfishers of 1919, a Great (Royal) Tern of 1920 and a Noddy Tern of 1924 (see Appendix A for details). The Belted Kingfishers were "a pair", and the Royal Tern and one of the Slender-billed Gulls were both credited with the unlikely date of January. These three species and the Noddy would have been new British birds if they had been accepted.

If the experienced Griffith was correct in these statements—and his words, published thirty-five years ago, have never to our knowledge been disputed—the implications are far-reaching. We are faced with at least a high probability that, at the same period and in the same localities that the Hastings Rarities were at their height, there was operating a brisk trade in unauthenticated and unrecorded rarities supplied to a wealthy and gullible collector who was also the purchaser of a substantial number of the Hastings Rarities accepted from the outset as authentic. There could conceivably be some credible means of explaining this situation, but if there is, it eludes us. At the very least, it puts the investigator on warning that no less than the most stringent and double-checked tests of authenticity of material from such a source will pass muster. This is not a situation in which any reasonable man can give the benefit of any doubt.

As additional warning, Griffith also wrote:

Unfortunately, Sir Vauncey was extremely careless in preserving the data of his acquisitions. He was very unwilling to shew his collection to anyone, or to allow any information to be published about it or any of the specimens comprised in it; and it seems certain that he was not infrequently imposed upon, buying as British birds obtained abroad.

And on another page:

There is no doubt but that Sir Vauncey's open-handed purchases, coupled with the extraordinary stream of rare birds sold him, has induced grave suspicion on the part of responsible bird-recorders in England.

Having in his hands so many of Sir Vauncey's specimens, and having had access to his correspondence and receipts for them, Griffith was well qualified to form an opinion. One of us (E.M.N.) was present in 1925 at the auction of the Harpur Crewe collection and can confirm the deep and widespread suspicion of their authenticity which was felt at the time. Few indeed would now care to be even as liberal as Griffith was in admitting specimens as authenticated. One final quotation from Griffith will serve to emphasise the problem:

> How extraordinarily difficult it is to be quite satisfied even by a completely credible witness, one very exceptional instance will shew.
>
> The late Mr. M. J. Nicoll, a keen observer and field collector, shot an Asiatic eared Wheatear at Pett, Sussex, in September 1905 and had it skinned, exhibiting the skin at the British Ornithologists' Club in the following month. In 1912 he took up a post in the Government Museum in Egypt and sold to the Brighton Corporation his collection of skins of which this was one of the principal gems . . . when the skin, fully labelled with Mr. Nicoll's own labels, was handed to Messrs. Pratt to be stuffed, they found that for the original skin had been substituted one skinned in the unmistakably oriental manner. Everyone who knew Mr. Nicoll would be quite certain that this substitution had been made without his knowledge. I decided to mount the substituted skin as representing Mr. Nicoll's original British bird. It was only the fact that the substituted skin had been prepared by an oriental, not a european, naturalist that enables us to realize that even Mr. Nicoll's warranty is in this case untrustworthy.

Whatever the explanation of this incident, it does nothing to assist the case for the authenticity of the Hastings specimens, confidence in which has always been to a substantial extent based on reliance upon their corroboration from this quarter. If such confusion could have occurred in such a simple case, can we be sure that there was not also confusion in others where such verification is not possible?

POSSIBILITIES OF COOL DECEPTION

Owing to the effective suppression, for whatever reason, of the main body of the first-hand evidence for which we should naturally look, we are compelled to pass on to the later stage at which the veil is first lifted. This, in the case of the great majority at least of the records, was in the shop of Mr. George Bristow, taxidermist and gunmaker, at 15 Silchester Road, St. Leonards-on-Sea. It was to him that the Hastings Rarities were brought, and by him that they were usually first shown to the various local ornithologists who were to place them on record in *British Birds* or by exhibition at the British Ornithologists' Club. Here, above all, we must again warn the reader to steer clear of personalities and speculations and stick closely to facts. It is a fact that in some way Bristow was able to produce in his day a greater number of first-class rarities than all the other taxidermists in England put together. It is a fact that he was determined to conceal the source of his specimens, and was allowed to do so. It is a fact that he refrained from taking opportunities offered to him at his own request for resolv-

ing, by putting some of his cards on the table, doubts which he knew to be grave and reasonably held. In view of these three facts, the only means which he left open of checking what he chose to reveal about the Hastings Rarities was critical examination in the flesh to determine whether or not the birds had been freshly killed.

It was more or less firmly believed at the time, and is believed by some to this day, that with reasonable care and experience it is possible to decide infallibly whether or not a bird examined in the flesh has been newly killed, and roughly how long it has been dead. If this is true and if the necessary scrutiny is proved to have been properly made in each case, then the authenticity of a number of the Hastings Rarities as British specimens is established in the face of every other objection and improbability. If it is shown to be not true, then the weight of evidence that they are not necessarily authentic becomes overwhelming. These, however, are not the only alternatives. If it is not proven that examination in the flesh is conclusive, or that it was promptly and critically carried out on the Hastings Rarities, once more the authenticity of the records cannot safely be sustained, since any doubt on this point undermines the only serious barrier against the conclusion to which all other evidence points. Moreover, even if it is accepted that the Hastings Rarities were freshly killed, the evidence for the localities and circumstances in which they were killed remains, in many cases, so flimsy and unconfirmed as to be worthless: there is still nothing to prove that many of them might not have been killed as far away as Yorkshire.

The core of the problem is to determine whether in those early days of refrigeration it would have been practicable to import dead specimens, for example from Black Sea and Mediterranean ports, in such a way that experts examining them in England could be deceived into supposing that they had been killed within the previous two or three days.

In view of the time lapse it is not easy to reconstruct the technical limitations during the relevant period, but the area of uncertainty is at least narrowed by Bristow's information (see page 329) that he had, in fact, received for mounting four albatrosses, a Gannet, a Cape Pigeon and a Hoopoe caught on a ship of the Natal Line and "placed in the refrigerator". Nearly all the Hastings Rarities were small or medium-sized birds, which could readily have been brought back in such conditions and brought ashore by one of the local pilot boats meeting the ships to guide them through inshore waters. It is, in fact, known that several of the rare species in question had been imported to Britain on ice. C. B. Ticehurst recorded that many Pine Grosbeaks were brought here in this way as early as 1889 (*Bull. B.O.C.*, 16: 47-48) and Howard Saunders stated that at the time of the first Black Lark record in January 1907 many "from the Continent" were on sale in Leaden-

hall market (*Brit. Birds,* 1: 14). Given the possibility of bird carcases being shipped to Hastings on ice, and given the worthlessness of the evidence regarding anything prior to the appearance of the corpses in the taxidermist's shop, we are, therefore, compelled to fall back on the strength of a single link in the chain—namely, the value of "examination in the flesh" as a safeguard against confusion between a newly-killed local bird and a foreign one imported on ice.

On this problem we have had the advantage, through the good offices of Sir Landsborough Thomson, of expert advice from Dr. J. Brooks, of the Low Temperature Research Station of D.S.I.R. at Cambridge. Unfortunately, most of the technical experience relates to birds considerably larger than the majority of those in question, but for a bird the size of a domestic fowl, despatched to this country in a ship's ice-box on a voyage of two or three weeks and arriving in warm weather, it is considered that there would be fewer evident post-mortem changes than in one shot locally and kept uncooled for three days or more. Deception would, however, become increasingly difficult as the local temperature fell, and the difficulty would be much more serious in winter. It would not be possible to get such birds here in a "just-shot" condition. On the other hand, any birds which arrived in unsatisfactory conditions need not be produced. In a properly designed and maintained ice-box the temperature in the storage compartment would be similar to that in a modern household refrigerator, namely about 40°-45° F. At such a temperature, advice from both the pathologist's and the refrigeration specialist's standpoint is that there would have been no special appearances to reveal the use of such transport provided the birds had not been exposed to temperatures low enough to freeze the tissues. While certain signs might possibly have been noticed by anyone skinning the specimens personally, it is not considered that normal "examination in the flesh" would have revealed anything wrong. Chilling alone would leave no traces that could be distinguished from those caused merely by the lapse of time since death. Dr. Brooks, who has made the principal contribution to the information here summarised, concludes, "I do not think an ornithologist would have detected it unless (a) he suspected that some such trick had been played, and (b) that he knew what to look for".

It is possible that some rather exacting experiments could throw further light on these technical aspects, but we have not felt it necessary to pursue the subject further, since there must always be doubt whether particular techniques and circumstances which might have applied so long ago were or were not being faithfully reproduced. If, as we claim to have demonstrated, there is no reasonable possibility of the Hastings Rarities being genuine, it is scarcely necessary to go further. However, as authorities whom we respect may still believe equally

firmly that deception would have been impossible, we have felt it advisable to record that:

(a) bird carcases were, in fact, transportable at the period in question for long distances through warm climates in chilled conditions;

(b) it is known that several such birds, over which no criticism arises, were actually sent to Bristow by a Natal Line captain;

(c) owing to pilotage arrangements at Dungeness, Hastings would have been a peculiarly suitable base for the receipt of carcases so imported;

(d) expert opinion supports the possibility that the ornithologists who were invited to examine such birds "in the flesh" could have been misled, and to raise this possibility in circumstances so unusual and unexpected does not throw any doubt or slur on their competence.

Before leaving this aspect, several additional points may be made. Information regarding the time-lag between the stated time of killing and examination in the flesh is slightly less exiguous than on most other aspects of the Hastings Rarities and for what this is worth, it does indicate in a number of cases a period quite sufficient to cause difficulty. For example, the highly improbable Masked Shrike stated to have been shot at Woodchurch, Kent, on 11th July 1905, is recorded as not having been examined in the flesh by M. J. Nicoll until three days later. In such cases it is even more difficult to accept the validity of the supposed authentication, but this is by no means the longest interval. The original Melodious Warbler (stated to have been "sent to Mr. Bristow at St. Leonards for preservation from Burwash in Sussex") was not shown by Bristow to the recorder until 24th June, although supposedly shot on 30th April. In the case of the male Brown-backed Warbler reported as from Ninfield on 13th May 1910, L. A. Curtis Edwards did not examine it in the flesh until the 21st, but wrote "The bird appears to have been recently killed and I personally have no doubt that the locality assigned to it is correct". This is an honest confession of inability to provide any valid evidence on the record.

It has not been thought necessary here to proceed beyond indicating one among the various alternative possible ways by which birds might have been passed off as locally shot when, in fact, they were not. Among other alternatives live importation is an obvious one, and a third possibility is the substitution of preserved specimens (consider for example, the case of Nicoll's Eastern Black-eared Wheatear described on page 321). These alternatives are not necessarily incompatible with the hypothesis outlined above, since more than one method may have been used at different times or for different species.

We are ourselves satisfied from our inquiries that, contrary to the

sincere belief of respected ornithologists, the possibility and indeed probability of deception having taken place must be accepted. In that event the law of economy of hypothesis points strongly towards it, since the maintenance of any other interpretation involves so much more extensive conflict with many well-established facts. One of the somewhat surprising features of the whole affair is that not until as late as 1917 (after the correspondence reproduced below) did any of those who examined the Hastings Rarities in the flesh appear to have felt it necessary to explain what criteria they had applied to test whether or not the birds might have been brought in on ice.

PUBLICATION AND CORRESPONDENCE

The last fact is remarkable because it was early appreciated that the occurrence in so small an area of so many extreme rarities would cause surprise and possibly suspicion. Recognition of the need for defending the theoretical probability of the records is shown in a number of contributions and discussions; indeed, the space devoted to speculations which we now know to be ill-founded is in marked contrast to the severe economy observed in regard to the publication of facts about the behaviour and condition of the birds up to the moment when they were "obtained".

Some of the most articulate and revealing contributions are those of that most able and well-loved ornithologist Michael J. Nicoll (1880-1925) who spent most of his rather brief life in the Hastings Area or in Egypt, to whose ornithology he made such an outstanding contribution. Nicoll was evidently much influenced by Gätke's path-finding work on Heligoland and concluded, rightly, that the bird movements characteristic of Heligoland must also in some way impinge on the British Isles. Unfortunately, several of his secondary conclusions on vital practical points were mistaken, and these may well have predisposed him in favour of the authenticity of the Hastings Rarities, his support of which, as has been noted above, played a vital part in their acceptance by leading ornithologists, and indeed still does.

Writing in *British Birds* (2: 88-89) on the Western Large-billed Reed Bunting obtained at Lydd (which, incidentally, had been skinned and mounted before he, who was responsible for the record, ever saw it), he said:

> It is somewhat difficult to account for the appearance of some South European birds in the British Islands. The present species and all other stragglers which have occurred, may have joined parties of other species, and thus found their way to our shores.
>
> In the autumn southerly gales may be the cause of the visitation of rare Chats and other birds. But some have occurred in our islands during the height of the summer, and these visitations can, I think, only be accounted for by the supposition that these birds had lost their mates, or that their nesting had been interfered with in some way, and that, following the migratory "impulse", they had pushed northwards and thus reached the British Islands, far to the north of their usual limit.

Apart from points which could not have been known at the time, this and all other explanations entirely fail to deal with the main point, which is why such a totally non-migratory form should travel at all.

Again, discussing the Brown Flycatcher (*Brit. Birds,* 3: 112-113) he wrote:

> Not only is this Flycatcher new to the British list, but this is the first occurrence of the bird in Europe, and it has never before been recorded as occurring west of Chamba, Kashmir. It is unlikely, for many reasons, that this example escaped from confinement, and an "assisted" passage—an easy way out of a difficulty—is not to be thought of in this instance.
>
> . . . Its winter range, however, extending to India, Ceylon, Malacca, Andamans, Hainan, South China, etc., gives us a clue, I think, to its appearance on our shores. The bird would meet during the winter such species as *Phylloscopus superciliosus*, and it seems quite possible that the example under discussion came westwards in company with some such species as the Yellow-browed Warbler, which, although of rare occurrence in Western Europe in *spring*, has been recorded at that season from Heligoland, and once just lately from Scotland.

It seems disappointing in view of these speculations that he should not have found it worth recording whether the bird was in company with others or, in fact, any detail of its life except that it "had been shot near Lydd".

A similar disappointment recurs over the Marsh Sandpiper (*Brit. Birds,* 3: 356-359), of which he stated baldly that the female "was shot on June 16th, at a pool of water in the beach on the west side of Rye Harbour. Two days later an adult male was shot at the same place". He then commented:

> It is satisfactory, though not surprising, that the Marsh-Sandpiper has at last been added to the British list. It has occurred on Heligoland and in Northern France, therefore it was only to be expected that sooner or later it would put in an appearance on our coasts. The occurrence of a rare straggler in England at a time when it should be in the midst of breeding operations would seem remarkable, were it not for the fact that this is by no means an unprecedented event. I know of several instances of the appearance in England of birds, not known to breed here, at a time when they should have been engaged in rearing their young. The cause of this is probably due to the fact that their eggs have been destroyed, and it being too early to migrate southwards, the birds have wandered aimlessly about until they reached our coasts. Such a solution is frequently suggested by Gaetke in his "Birds of Heligoland".

He then went on to give some observations of his on Marsh Sandpipers in Egypt, apparently unaware of the much greater value and interest which his note would have held if it had included even a few first-hand details of these Sussex birds in the field.

The same story is repeated with the addition to the British List of the Slender-billed Curlew in September 1910 (*Brit. Birds,* 5: 124). A "flock" was reported to have arrived on Romney Marsh. Two "were obtained on September 21st, and the male was shown to me in the flesh the same day". Yet, although an adult male was shot two days later, Nicoll was content simply to examine each bird "before it was skinned".

This omission of virtually all first-hand information, and failure to go out and observe even birds reported as staying at the same spot for days or even weeks on end is a unique feature of the Hastings Rarities, and in marked contrast to the full details provided at the time by such other rarity specialists as G. H. Caton Haigh in Lincolnshire (compare his account of the first Lanceolated Warbler, which immediately precedes that of the Marsh Sandpiper), W. Eagle Clarke at Fair Isle and elsewhere, and J. H. Gurney and many others in Norfolk, to name only a few. It is all the more inexplicable in view of the keen interest felt in the precise circumstances bringing such birds here which the recorders of the Hastings Rarities shared with so many ornithologists of the period.

Can so total and systematic a series of omissions have been accidental? If so, how can it be reconciled with the known field interest displayed in other connections by some of the principal recorders. Why were they apparently hardly ever enabled to see for themselves some of the rarities which were of such interest to them, and at large so near at hand? If there was some reason for secrecy, what was it, and how could it be reconciled with the full and immediate publicity given to the specimens themselves? We can only return, baffled, to the record, which shows that the crisis was at last reached in 1916, when the January issue of *British Birds* contained records of no less than six species new to the British List, all Hastings Rarities, a couple each being vouched for by H. W. Ford-Lindsay, Thomas Parkin and J. B. Nichols.

The details provided for this astonishing galaxy were in accordance with usual Hastings practice. Ford-Lindsay's Moustached Warbler "was shot at St. Leonards-on-Sea" on 12th April 1915, was examined in the flesh by him and was in the collection of J. B. Nichols. Thomas Parkin's Olivaceous Warbler was "brought me in the flesh" by G. Bristow, having been "shot on May 20th 1915, close to Holmhurst, on the outskirts of Hastings and St. Leonards". It was also in the collection of Nichols. Parkin's North African Black Wheatear "was brought me in the flesh for examination by Mr. G. Bristow. The bird had been shot on June 7th 1915 at Pevensey Sluice". It was also in the collection of Nichols, who himself recorded a Cape Verde Little Shearwater "picked up at Pevensey, Sussex, on December 4th, 1914" and another "caught at West St. Leonards, Sussex, on January 2nd 1915 and kept alive for two days". Both birds were examined in the flesh at the time by H. W. Ford-Lindsay. The fifth of this month's additions to the British List was a North Atlantic Shearwater, recorded by Nichols in correction of a previous record of the same bird as a Great Shearwater by Ford-Lindsay, who completed the half-dozen by reporting that in September 1914 "a couple of Grey-rumped Sandpipers (*Tringa incana brevipes*) were observed at Rye Harbour", the male

being shot on the 23rd and the female on the 27th, when both were shown to him in the flesh and added to the growing collection of J. B. Nichols.

This same January issue contained no less than ten more Hastings Rarities, including a sight record of a White-winged Lark (see page 316), a two-year old record of a Madeiran Little Shearwater which "was shot", three Killdeers which "were observed" but later "were obtained" and examined in the flesh by Ford-Lindsay, who also recorded a Greater Yellowlegs which "was shot at Winchelsea" and "examined by me in the flesh the next day". Finally, Parkin contributed a refreshingly informative sight record of a Mediterranean Black-headed Gull among a flock of Black-headed Gulls being fed by ladies on Hastings front and commented, "I am glad to say that no shooting is allowed along the front at Hastings and St. Leonards, so that I hope this bird may be allowed to remain unmolested, and not meet with the fate that unfortunately happens to any rare birds which visit this neighbourhood".

This galaxy proved the last straw. In an undated letter which was evidently sent some time before that issue went to press, since it concerned the Olivaceous Warbler, H. F. Witherby wrote most candidly to Parkin:

I suppose this will be another new Brit. bird in which case perhaps I had better send it to Hartert for confirmation as the 1st primary is rather short. Did you see it in the flesh? I am very glad you are taking up some of these records & I do wish you would do more. It is *most* important that someone entirely independent should examine them in the flesh. Do you know anything about a *Lusciniola melanopogon* which F. Lindsay sent to me for examination—of course stuffed. I suppose that will have to be accepted & also a *Totanus brevipes*. Did you see the Black Larks in the flesh? I cannot understand all these rarities being got at Westfield—it seems to me most fishy.

There was due cogitation in Hastings; then the editor of *British Birds* received the following letter:

To H. F. Witherby Esq.

15 Silchester Road,
St. Leonards on Sea.
June 30th, 1916.

Dear Sir,

For some considerable time I have had hints that you & other ornithologists entertain doubts as to the authentieity of some of the rare birds I get, & I must admit not without reason; I will endeavour to show you as briefly as possible how I get many; I am also the only gun & ammunition dealer in St. Leonards, consequently I get a great many persons in who use a gun, such as farmers, keepers, market gardeners &c, and as I have a good show of stuffed birds &c it causes conversation, and I invariably ask if any bird is seen out of the ordinary, to procure it for me, & many do so, naturally the great majority are no use, but I always give something for whatever is brought & now & then a good bird is brought; I will instance a few, about 10 or 12 years ago Mr. L. Curtis Edwards was in my shop, when a Mr. Morris a market gardener at Ninfield brought in a Red Throated Pipit, I believe Mr. Edwards recorded it in the Zoologist, I gave Morris 2/- for it, during the same year he brought from 30 to 40 Meadow Pipits that I purchased, so that took the profit

of the other, but one morning on his journey down he picked up an Orphean Warbler under the telegraph wires, & has also shot a Rufous Warbler & 2 Meadow Buntings &c. so in the end it pays to buy all they bring.

Another market gardener at Westfield generally brings some every week, two years ago he brought the two Ruppell's Warblers; but I do not remember any others but common, until last week he brought a Cetti's Warbler, Mr. Parkin exd it in the flesh soon after.

Another at Rye Harbour, Saunders, I have had many birds from, amongst them generally a few Greenshanks every year, last year he sent a fine Greater Yellow-Shank, now you cannot expect me after buying a lot of birds unsaleable, to tell that man, or any other in a similar case, that particular bird is very rare; he thought it was a Greenshank & was satisfied with what I gave him, it is my living & I am entitled to do it in an honest way the best I can.

When I get any uncommon birds I generally show them at once in the flesh to some responsible person & I fail to see what else I can do to satisfy these doubts.

If I give the name of a person who shoots a rare bird & they are seen or written to, many would not like it, as probably they have no gun licence (or it is the close season) & have simply a .410 or No. 3 Saloon gun to kill birds on their allotments &c.

And there is also another side, I have given names at times & not always to my advantage, some years ago a man at Pett brought me an immature Squacco Heron & asked 5/- for it, a Mr. Chapman of Rye who formerly had a collection of local birds saw it at my shop, & purchased it, but he required the shooters name simply as reference, the following Sunday he went & found the man, & asked him to send any other rare bird to him he would give more than Bristow, this bird was worth quite 20/- he told him.

A friend of yours also told a man from whom I brought an Avocet for 20/-, he would have given £5. I was considerably annoyed by these two men, coming saying I had swindled them.

Another case was a carrier from Robertsbridge named Glyde, he brought me a fine Kite with a message the owner would call in a few days for what I would give for it, if I did not want it, to mount it for him; soon after a young lady who was engaged to a Mr. Studwick who has a collection of birds, called with a job and saw the Kite, I happened to say a carrier from Robertsbridge had brought it, the next day he Studwick cycled over & ferretted out the man & bought the Kite for 5/- & I understand was considerably elated over dishing Bristow as he called it.

I have been told that the idea is I have birds sent over frozen, but that is preposterous, could I possibly get captains of ships or other officers to bother themselves over these little things? even if I could it would have been found out years ago, I have never had any birds in that way with the exception of a captain of one the Natal Line of Steamers whose home is here, and he has sent me to mount 4 Albatroses, a Gannet, a Cape Pigeon & a Hoopoe, these were caught on his ship at different times and were placed in the refrigerator.

If you look over the birds that Mr. M. J. Nicol collected & also those he only saw, & also the number Mr. Alexander has seen lately in this neighbourhood, one need not be surprised at what is got here.

If you can suggest anything for me to do to allay these suspicions I should be glad to assist, but I cannot promise to give the names & addresses of every one if they object.

Apologing for troubling you
I am Yours faithfully,
GEO BRISTOW

P.S. I might add, all the rare birds I get are not recorded, some if I consider are escapes & some I mount for customers who do not wish them recorded, I do not say anything about.

This year I have had a Saker Falcon & a very uncommon looking duck with

white face chestnut breast I considered both might have escaped & I have also had as you are aware 2 Calandra Larks, but as they were in a party of 5 I have no doubt they were genuine wild birds I saw 4 myself. I believe a single one or two has been here before.

To G. Bristow 1st November, 1916.

Dear Sir,

I much regret the long delay* in answering your letter.

You ask me to impose some conditions regarding the birds which come into your hands so that the records may be more fully substantiated. It is of course difficult to see how to do this in such a way that all those who are doubtful about them shall be satisfied. I suggest the following:—

1. That all birds shall be shown in the flesh to Dr. N. F. Ticehurst.
2. That whenever required the bird shall be skinned before Dr. Ticehurst and the body handed to him.
3. That the name and address of the shooter shall always be sent by you to me. That I shall be allowed to make inquiries in such a way that no harm shall come to the shooter, and I will undertake that no offer or idea of the value of the bird shall be given to him.

A so-called rare British bird is of no more value to me than the same bird got in its usual haunts. The collecting of these stragglers or rare migrants is merely a pastime not a science. Of course the record of the occurrence of the bird is very interesting, but I mean the actual skin is of no more scientific interest in my opinion than if it had been got in the bird's usual habitat, except of course as evidence of the record.

Any proof you can afford additional to the above it would be wise to give me at once. There are certainly a number of ornithologists who do not credit these records and every bit of proof you can give is helpful.

If I can manage to come down in the spring would you be prepared to take me over to some favourite spots? I am not at all sure that I can do so during the war, but I might be able to arrange it, and I suppose April or May would be the most likely time to see something.

Yours faithfully,
H. F. WITHERBY

To H. F. Witherby Esq.

15 Silchester Road,
St. Leonards-on-Sea.
Jan. 22nd, 1917.

Dear Sir,

I am sorry for my neglect in not sending a reply to your letter of Nov. 1st.

I think you proposed I should show any rare birds worth recording to Dr. N. F. Ticehurst in the flesh and also skin them before him, I have not the slightest objection to that, or to sending to you the names and addresses of the shooters in the majority of cases, but in the close season I am sure some would object such as policemen, last year one shot 2 Collared Flycatchers and another a Black Throated Chat on their allotments, they would be liable to forfeit pensions if it were known.

In similar cases I conclude it will be better to not record them.

Just now I am getting very few birds of any kind through all the young men being called up, and the remaining ones having no time for shooting, I have had a Gt. Grey Shrike, Rough legged Buzzard, and Bittern, but I get these every winter.

With thanks, I am Yours faithfully,
GEO BRISTOW

*Although Witherby does not explain this he was preoccupied as a naval officer on active service.—Eds.

Here the Bristow correspondence ends, but the story is continued in correspondence after the war with J. B. Nichols.

To H. F. Witherby Esq. 2 Cedars Road, Clapham.
Aug 27 1920.

Dear Mr. Witherby,

I enclose particulars of four birds I have recently added to my collection and I wish recorded in British Birds.

They were all examined in the flesh by Mr. Ruskin Butterfield. I shall be pleased to let you or Mr. Hartert examine the birds if you wish.

Hoping you keep well, Yours truly
J. B. NICHOLS

On the reverse of the same small sheet of notepaper were claims for a Pallid (Olivaceous) Warbler "shot at Pond Wood, St. Leonards-on-Sea, Sussex, and another one thought to be seen" on 16th June 1920, and a second male Pallid Warbler "shot in the same place, Pond Wood" on 19th June; also a male and female Sharp-tailed Sandpiper "shot at Rye, Sussex, by a visitor shooting Dunlins &c" on 6th August. Witherby replied:

To J. B. Nichols Esq. September 16th, 1920.

Dear Mr. Nichols,

Some time ago I wrote to Mr. Bristowe setting out certain conditions under which records of rare birds derived from him would be acceptable to us and subsequently he agreed to these conditions. As he has not complied with these conditions with regard to the birds you wrote to me about, I am sorry I cannot accept the records for publication in "British Birds". You will probably remember that I talked over these conditions with you at the time, and you agreed with me that they were altogether reasonable. I am also taking the matter up with the B.O.U. List Committee, of which I am a member, as such records are of course worse than useless unless we can be perfectly certain that the birds were wild birds obtained in this country. It is not that I doubt Mr. Bristowe, but that I do not consider the evidence given is sufficient to form a proper opinion, and I cannot understand why Mr. Bristowe having accepted my conditions has never once since then carried them out.

If you wish me to examine the birds to see to what subspecies they belong, I shall be glad to do so if you will kindly send them to me c/o Dr. P. R. Lowe, Natural History Museum, Cromwell Road.

Yours faithfully, H. F. WITHERBY

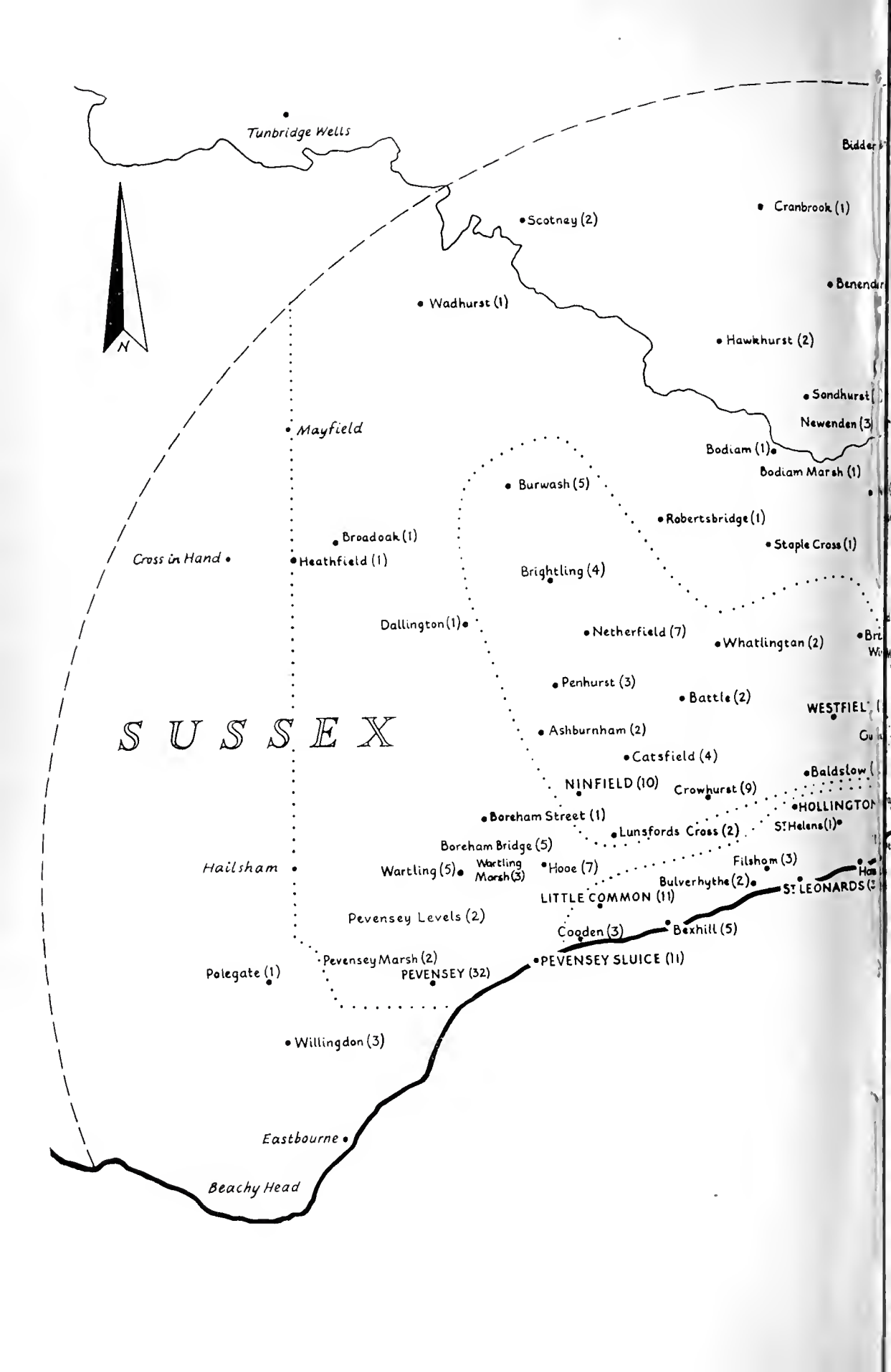
This led Nichols to request, on 20th September, "a copy of the conditions you sent Mr. Bristow that he agreed to. My impression of our conversation was that the bird should be shown in the flesh to a member of the B.O.U. such as Mr. Ticehurst or Mr. Ruskin Butterfield. . . ." The next day Witherby wrote:

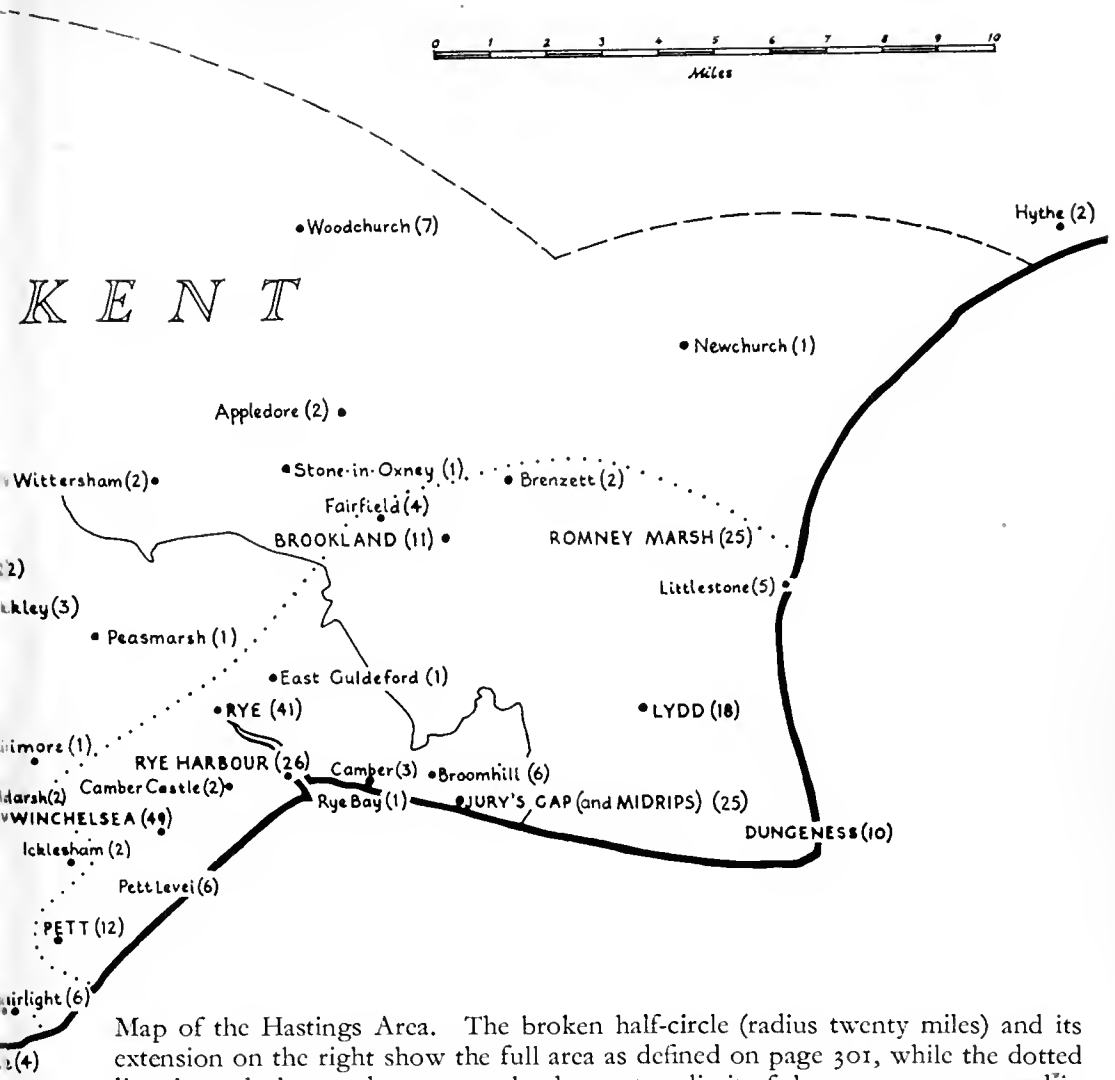
To J. B. Nichols Esq. September 21st, 1920.

Dear Mr. Nichols,

I enclose a copy of the conditions I made in 1916. Mr. Bristowe has not carried out in one single instance these conditions since the date of the letter, although he accepted the conditions and in the first place asked me to impose some conditions which might be satisfactory to all those who are doubtful about these records.

Yours faithfully, H. F. WITHERBY


Tunbridge Wells
N
Scotney (2)
Cranbrook (1)
Wadhurst (1)
Hawkhurst (2)
Sondhurst
Newenden (3)
Bodiam (1)
Bodiam Marsh (1)
Mayfield
Burwash (5)
Robertsbridge (1)
Broadoak (1)
Staple Cross (1)
Cross in Hand
Heathfield (1)
Brightling (4)
Dallington (1)
Netherfield (7)
Whatlington (2)
Penhurst (3)
Battle (2)
WESTFIELD
SUSSEX
Ashburnham (2)
Catsfield (4)
Baldslow
NINFIELD (10)
Crowhurst (9)
HOLLINGTON
Boreham Street (1)
St Helens (1)
Lunsfords Cross (2)
Boreham Bridge (5)
Hailsham
Wartling (5)
Wartling Marsh (3)
Hooe (7)
Filsham (3)
Bulverhythe (2)
ST LEONARDS
LITTLE COMMON (11)
Pevensey Levels (2)
Cooden (3)
Bexhill (5)
Pevensey Marsh (2)
PEVENSEY SLUICE (11)
Polegate (1)
PEVENSEY (32)
Willingdon (3)
Eastbourne
Beachy Head



Map of the Hastings Area. The broken half-circle (radius twenty miles) and its extension on the right show the full area as defined on page 301, while the dotted line through the word SUSSEX marks the western limit of the narrower area used in much of the discussion. The other dotted lines enclose the three concentrations—two coastal and one hinterland—which between them account for four-fifths of the records and almost all the extreme rarities. The continuous line running diagonally from the top left-hand corner marks the county boundary. Sight records have been omitted from this map which is therefore confined to the localities connected with 532 of the specimens listed in Appendix A on pages 348-373 (the remaining ten being outside the area or inadequately pin-pointed). Some of the localities are rather loosely quoted in the literature and, for example, it is certain that many of the records under "Rye" actually refer to Rye Harbour or even Camber Sands; similarly, "Pevensey" was often used to cover Pevensey Sluice or Pevensey Levels, and "Jury's Gap" included the Midrips. The published localities have been followed as exactly as possible, however, except that the word "near" has been ignored in compiling this map and a few records from "between Winchelsea and Rye" are given under Winchelsea alone. The figures in brackets after the names show the total number of specimens assigned to each locality (places with ten or more specimens being printed in capitals) and the alphabetical list overleaf gives individual cross-references to Appendix A. Italicised localities on the map have no significance except as markers

(*drawn by Robert Gillmor*)

On 27th September, Nichols wrote again:

> Thanks for your letter. I had been under the impression that Bristowe had been complying with your requirements in showing the birds to Mr. Ruskin Butterfield but find I was mistaken. I will write to Bristowe and hear what he has to say.

And, so far as is known, that was the end.

Whether or not Bristow's letter of 30th June 1916 is entirely his own original composition, and despite its guarded and defensive tone, it throws much light on the Hastings Rarities. It is, of course, a fundamental truth that the British List is not a catalogue of birds which have come to Britain, but simply of an unknown proportion of them which happen to have been identified and recorded here by ornithologists. Opinions may well differ as to the numbers and composition of the normally unrecorded element, but much experience of results from different densities of observance and different degrees of skill among people looking for rare birds in different areas has given some empirical data about the practical possibilities of reducing the numbers of rarities missed. In order to accept the genuineness of the Hastings Rarities, it is certainly necessary to accept the "British Heligoland" thesis that there is something uniquely favourable in that area for the occurrence of extreme rarities. But that is not enough. We also have to accept that during the first two decades of the century, and neither before nor since, the Hastings area possessed a force of collectors much more skilful and efficient than any of the present local groups of bird-watchers or bird observatories, or than other groups of collectors at the time. The Bristow letter purports to let us into the secrets of this outstandingly successful group and how they worked. As such it is, to use his own word, preposterous. The one practical result to be expected from paying ignorant market gardeners to shoot and bring in everything (including Meadow Pipits) would not be to throw up one extreme rarity in, say, forty birds, or even four hundred, but to bring about the early bankruptcy of the open-handed taxidermist.

The odds against anyone, and particularly a tied-down market gardener in an inland parish, securing within a couple of years two Rüppell's Warblers (a species which has defied the efforts of the greatest experts to find it anywhere this side of Athens) and then a Cetti's Warbler are not only long, they are almost infinite. Yet this performance of the unknown market gardener at Westfield was almost matched by Morris, the untraceable market gardener at Ninfield, who accounted for a Red-throated Pipit, an Orphean Warbler, a Rufous Warbler and two Rock Buntings (called Meadow Buntings in Bristow's letter), and, on the evidence of the records, it was probably equalled by a score of other unsung village heroes of the wealden clay. Whatever may be the true explanation of how these birds got to Hastings,

this cannot be it. The admissions about other rare birds being left unrecorded, and about Bristow's readiness to connive in the breaking of the law in the interests of a frankly commercial business, are also of some significance, as is the passage in which he discusses the importation of frozen specimens, without attempting to deny its practicability.

Witherby's letters are conclusive that the unsatisfactory nature of the evidence made available for these records was as much a cause of anxiety for the editors forty years back as it is today. Had Bristow and the others associated with him found it possible to comply with these conditions, the reasonableness of which was confirmed by Bristow himself in his reply of 22nd January 1917, the question whether the specimens were, in fact, locally killed or had been imported frozen could have been cleared up by our distinguished colleague Dr. N. F. Ticehurst, who was nominated for this purpose. Unfortunately, he was deprived of the opportunity as the offer which had been invited and accepted was not complied with. So far as *British Birds* was concerned, this failure led to a cessation of publication of further records of Hastings Rarities dating from after this time, with one or two minor exceptions, and one major one, the acceptance for *The Handbook* of the only European record of the Masked Wagtail on 26th April 1919, presumably on the ground that it was examined in the flesh by Nicoll, an ornithologist of international reputation. Whether by coincidence or otherwise the flood of Hastings Rarities abated after the correspondence here reproduced, and within a few years it entirely dried up. It is now a quarter of a century since Collared Flycatchers and Cetti's Warblers, Dusky Thrushes and Pine Grosbeaks have rewarded the earnest peerer into the local trees and thickets, or since parties of Black, Calandra and White-winged Larks could be peppered by gunners on the marshes.

COMMENTS AND A STORY FROM YORKSHIRE

That a number of other contemporary naturalists had the same doubts as were expressed by the editors of *British Birds* is shown by the following extracts from *The Naturalist*. The first is from an article by the editor, Thomas Shepherd, entitled "Bearded Tits at Hornsea" and published in 1911 (p. 349):

> The Bearded Tit *is* a British breeding bird, and will therefore not be likely to appear in the pages of *British Birds* as still another 'New British Bird.' We quite agree with our contemporary that several records have appeared in its pages which 'it has been impossible to say if the bird referred to was a genuine migrant or an escape from captivity.' That has been our opinion too, though we do not remember having seen this stated when the record was made. It has usually been a 'new British bird', seen in the flesh somewhere in Kent or Sussex, or thereabouts. We are relieved to learn now that the editors at last share the opinion of so many of their readers and throw doubt upon the records.

In any case, is this recording 'new' occurrences advancing science even as much as introducing the Bearded Tit at Hornsea, where its habits can now be watched? Personally we consider that the mere swelling of the present long list of British birds by records of single individuals that have either fallen or been pushed in Kent, or thereabouts, is not 'science' any more than is the addition of a new button or postage stamp to a collection of those trifles.

Two other extracts from *The Naturalist* show that the problem may not have been confined to Sussex and Kent. The first of these appeared early in the 1915 volume (pp. 3-5):

The Story of a 'New' Bird

On May 13th last, two Black-headed Buntings were exhibited at a meeting of the British Ornithologists' Club, and were referred to in the Club's Bulletin No. CXCVIII., pp. 133-4. One had been caught at Halifax, Yorkshire, in December, 1910, and kept alive in an aviary at Hove until May, 1912, when it was killed by a Corn Bunting. The other had been shot at Battle (Sussex) in April, 1912. We referred to the matter in 'The Naturalist' at the time, and regretted that our Yorkshire specimen should have been mixed up with a Sussex bird, because rightly or wrongly, northern (and some southern) ornithologists have received with suspicion so many of the new bird records from the south. Our contemporary, 'British Birds', also referred to the record, but without comment.* (*July, 1914, p. 55)

A Yorkshire Record

The Yorkshire bird had been supplied by a Mr. Hamilton, herbalist, etc., of Halifax. As it was the first county record, Yorkshire ornithologists were anxious to verify it, and asked the Secretary of the Halifax Scientific Society to investigate. He called upon Mr. Hamilton, but that gentleman's mind seemed to be a blank; he knew nothing whatever about it! Later, the Curator of the Museum at Hull wrote to Mr. Hamilton enclosing a catalogue of the birds in the Hull collection, and asking to be informed of any species in Halifax which were not at Hull. Particular mention was made of a Black-headed Bunting, which he had seen from the papers had been supplied to a collector in Sussex.

A Halifax Dealer

Mr. Hamilton nibbled. He wrote. 'I could not say how long I might be getting one in the flesh, *having now four on order,* but I have very great facilities for offering rare and ordinary specimens and send to the Elite of Society and Such. At the present time I can only supply two Black-headed skins for £1 and eggs 1/- each. I always send to first P.O. or return cash.' Enclosed with his letter was a long list of skins recently supplied 'some in the flesh, also eggs, and can still supply another lot of each.'

A Halifax Record

In reply to a question as to the authenticity of the Halifax specimen, (which he had forgotten about when he was called upon) Mr. Hamilton replied, 'The Black-headed Bunting was sent alive and not shot, and certainly not like those I also offer imported.' However, on October 1st, the Curator of the Museum at Hull wrote saying he was not wanting anything but Yorkshire birds, so the correspondence ended.

And later the same year came the following sequel:

An Apology

As Mr. Hamilton had been visited by the Police, we felt that the time had arrived to get a statement from him, with an apology. In reply to our letter he states, under

date January 10th, 'I did not know a Lesser Blaek Headed Bunting, never having had one to my knowledge . . . and as to Ripon, one is apt in trade to make the most and get the most . . . I very mueh regret selling you the bird ineorreetly described . . . part of the other information (as to the loeality) was only business in sale.'

Moral

After his various lapses of memory and terminologieal inexaetitudes, this dealer therefore admits that his loealities are taeked on to his speeimens 'merely for business reasons,' and in order 'to make the most and get the most.' Sueh a method was doubtless adopted for the new Halifax Blaek-Headed Bunting, seen in the flesh in Sussex and now preserved in a Sussex Museum. Having thus fairly well proved that in this instanee the record was wrong, there is quite a suspicion, in faet more than a suspieion, as to the bona fides of other reeent reeords of new British birds, 'seen in the flesh'. We eertainly think naturalists will now be justified in deleting several recent 'new reeords' from their lists.

AN ILLOGICAL SITUATION

There clearly remains a lot of unfinished business to be tidied up. Scientifically it clearly does not make sense that post-1916 records of Hastings Rarities should have been systematically rejected for failing to meet acceptable standards, while pre-1916 records which equally fail to meet these standards remain unquestioned. There were reasons which justified and, indeed, compelled our predecessors to leave things that way. Many leading British ornithologists (beginning, as has been seen, with the veteran arbiter Howard Saunders in the first issue of this journal) had been persuaded to accept the earlier Hastings Rarities and, as one by one most found themselves forced to make an agonising reappraisal, almost insoluble personal and legal problems arose. It was one thing to face squarely the scientific issues and to insist on the most exacting standards before admitting new records, but quite another at that time to risk touching off litigation and disputes whose end could not be foreseen, and which might well have caused permanent harm to British ornithology. Moreover, although suspicions remained strong, as is shown by the quotations from contemporary sources reproduced in the preceding sections, there was still no proof. Perhaps the Hastings Area was the El Dorado which it had been made out to be; perhaps subsequent observation on quite different lines would yield independent confirmation. Up to the establishment of Dungeness as part of a national chain of expertly operated bird observatories in 1952, it might still have been argued that we had no evidence against the claim that there was something uniquely favourable for rare migrants about the Hastings Area. The first decade's results of the Dungeness observatory appear conclusively to prove the contrary. It would be far easier now to sustain a claim that Portland Bill in Dorset is more particularly favoured by rarities than the Dungeness region. The results at Dungeness are indeed closely consistent with those gained before 1920 by such pioneer bird-watchers as the Alexanders and the Duchess of Bedford, and bear no resemblance to the Hastings

Rarities. On the other hand, the experience of such a favoured and expertly watched station as Fair Isle is remarkably consistent now with that of fifty years ago, and tends to rule out any explanation which assumed sweeping changes in the flow of bird visitants.

To illustrate how arbitrary and illogical the situation became it is worth noting the sort of records which, not fulfilling the requirements laid down, were never accepted and incorporated in standard works. We have already noted how the Masked Wagtail of April 1919 was rather surprisingly accepted for *The Handbook*, but this appears all the more curious in view of the rejection of the Long-tailed Rose Finches stated to have been shot at Little Common on 11th February 1919, since two of the latter were exhibited by Nicoll at the same meeting of the B.O.C. as the Masked Wagtail. The only difference was that the Rose Finches had been "examined in the flesh" by Butterfield. There were, of course, several other post-1916 novelties which were similarly turned down—the Belted Kingfishers (1919), the Royal Tern (1920) and the Wilson's Phalarope (1925).

Even more illogical is the fact that later specimens of several species which had previously been accepted were frequently (but not always) rejected. A Killdeer claimed to have been shot on 29th August 1919, near Rye, is mentioned in Walpole-Bond but not in *The Handbook*. Four Rustic Buntings, which the editors of *The Handbook* did not hear about until 1938 although they concerned the period 1903-10, were cautiously mentioned in the "Additions and Corrections" as "following occurrences recorded . . . have not been investigated by us". An American Golden Plover from Rye, dated 22nd September 1916, just scraped into *The Handbook*, and so, illogically, did a "pair" of Slender-billed Curlews from Pevensey Sluice, dated as late as 18th May 1919. Just a year earlier, a further Spotted Sandpiper from Rye was also admitted, but three more from Pevensey, dated 13th May 1920, were merely referred to as "Others recorded but not fully authenticated". A significant case is that of the Olivaceous Warblers mentioned in the Nichols/Witherby correspondence above: *The Handbook* (2: 67-68) says: "*England.*—One. Male, near St. Leonards-on-Sea (Sussex) May 20, 1915 . . . Two males shot Hollington (Sussex), June 14 and 19, 1920, also recorded (W. R. Butterfield . . .)." The recorded evidence (*Brit. Birds,* 9: 198) for the accepted 1915 record which placed this species on the British List is just as flimsy as that for the two subsequent rejected records from the same district. The only difference is that one preceded and the other followed the correspondence published on pages 328-330.

The Handbook cautions against other dubious records from this area. Under North Atlantic Shearwater we read, in square brackets, "Female insufficiently authenticated Sussex, Nov. 9, 1920", and under Wilson's Petrel, likewise in brackets, "also not fully authenticated . . . Oct.

1916". In each case pre-1916 Hastings records had been accepted. The same applies to the Cape Verde Little Shearwater: 1914 and 1915 records were fully accepted and then we find, once more in square brackets, "One insufficiently authenticated recorded Kent, Mar. 9, 1922" (the year was actually 1923 and *The Handbook* makes no mention of the Madeiran Little Shearwater which was stated to have been picked up dead at the same place on the same day). Among other post-1916 records not mentioned in *The Handbook* (but included in square brackets in Appendix A) are Whiskered Terns, a Great Spotted Cuckoo, Western Desert and Western and Eastern Black-eared Wheatears, a Red-throated Pipit and a Pine Grosbeak.

We therefore have to face the fact that, in logic and reason, there is nothing to choose between the evidence supporting records of rarities which were rejected in the later period and a great many in the earlier period which were admitted in spite of being by today's standards quite insufficiently authenticated. While it is easy to appreciate how this illogical situation came about and how grave would have been the difficulties in 1920 of retrospectively reviewing the entire series as we have had to do now, it is impossible to find any remaining justification for rejecting so many of the later Hastings Rarities and for accepting so many of the earlier. The difficulty is increased by the fact that the earlier claims, unlike nearly all the later ones, involved actual additions of new species or subspecies to the British List, and, therefore, much more is at stake over them.

CONCLUSIONS AND RECOMMENDATIONS

Having analysed the facts, reviewed the history of the Hastings Rarities and examined the various arguments and explanations which can be offered, we now come to our conclusions and recommendations.

Concerning the Hastings Rarities themselves, there are many inherent improbabilities calling for explanation. Their absolute numbers are suspiciously high for any such area and period. The proportion consisting of new species or subspecies and other first-order rarities is particularly excessive in relation to normal expectation, as is also the proportion of multiple occurrences, especially pairs. The seasonal distribution is odd and the geographical distribution within the area, especially as regards inland occurrences, is mystifying. Negatively, the absence or near absence of relatively rare species which are known or may be presumed to have occurred, and the absence of certain groups of birds as a whole are inexplicable. The occurrence of a number of birds from long distances which are hardly known to travel at all is especially perplexing. The pattern of bird behaviour and of observer cover and activity presupposed by such records does not correspond with any of which we have knowledge, nor does it appear consistent within itself.

Turning to the primary evidence of the finding, observing and securing of the birds collected, we find it almost non-existent. In no single case would the available facts be sufficient to justify acceptance by present-day canons, and in the great majority further details would certainly be invited before such records were even seriously considered. Although standards have certainly been raised, other records published in the same period were on the whole much more nearly in conformity with modern requirements, and were sometimes excellent. The omission of such details can only be attributed to deliberate and systematic concealment, or to a very high degree of negligence and carelessness for scientific requirements. Concealment was admitted on grounds which could not be peculiar to the Hastings Area and it must be dismissed as a quite inacceptable excuse for the failure to provide elementary data or independent confirmation.

As regards the secondary evidence on processing and verification, there is no suspicion that any of the specimens are fakes in the sense of being disguised to appear other than what they really are. Many of them still exist, and their identifications by the highest authorities are clear and undisputed. In the absence of direct primary evidence, however, their authenticity turns on the degree of certainty that they were, as claimed, birds freshly killed in the district. The fact that all attempts at alternative and independent verification of the occurrences were successfully frustrated or evaded justifies the deepest suspicion in itself. This is confirmed by the curious circumstances in which the effort to provide effective means of verification in 1916 was eventually followed by a sharp drop in the long series of occurrences. None of those affected by the refusal to accept further records on the same basis produced any evidence to rebut their condemnation as unsubstantiated. They still chose not to put their cards on the table. In addition, there was a considerable element of commercial gain involved for the one taxidermist concerned with the entire series. We are satisfied that deception was practicable as far as the origin of these birds was concerned, and the time which had elapsed after death. Thus the only alleged objective check on their authenticity cannot be regarded as reliable. That being so, it appears plain that the records cannot properly stand. We accordingly make the following recommendations:

(a) That the following species be completely deleted from the records accepted by this journal, from *The Handbook* and from the *Check-list of the Birds of Great Britain and Ireland* (those marked ‡ have been recorded elsewhere in the British Isles since the publication of *The Handbook* and so need to be newly considered for readmission; *Check-list* numbers are given on the left, with *Handbook* numbers in brackets):

‡ 20 (361-2) Cory's (=Mediterranean and North Atlantic) Shearwater (*Procellaria diomedea*)
153 (391) Slender-billed Curlew (*Numenius tenuirostris*)
167 (434) Grey-rumped Sandpiper (*Tringa brevipes*)
‡168 (420) Terek Sandpiper (*Tringa terek*)
‡180 (410) Semipalmated Sandpiper (*Calidris pusilla*)
266 (64) Black Lark (*Melanocorypha yeltoniensis*)
‡267 (65) Calandra Lark (*Melanocorypha calandra*)
‡326 (141) Cetti's Warbler (*Cettia cetti*)
‡331 (142) Moustached Warbler (*Lusciniola melanopogon*)
‡341 (157) Olivaceous Warbler (*Hippolais pallida*)
349 (166) Rüppell's Warbler (*Sylvia rüppelli*)
‡350 (167) Sardinian Warbler (*Sylvia melanocephala*)
‡367 (122) Brown Flycatcher (*Muscicapa latirostris*)
‡369 (124) Collared Flycatcher (*Muscicapa albicollis*)
387 (118) Masked Shrike (*Lanius nubicus*)
426 (60) Snow Finch (*Montifringilla nivalis*)

(b) That the following subspecies be completely deleted from the records accepted by this journal, from *The Handbook* and from the *Check-list of the Birds of Great Britain and Ireland*:

17 (358) Cape Verde Little Shearwater (*Procellaria baroli boydi*)
20 (361) Mediterranean Shearwater (*Procellaria diomedea diomedea*)
20 (362) North Atlantic Shearwater (*Procellaria diomedea borealis*)
134 (437) Semipalmated Ringed Plover (*Charadrius hiaticula semipalmatus*)
307 (183) Alpine Ring Ouzel (*Turdus torquatus alpestris*)*
316 (196) North African Black Wheatear (*Oenanthe leucura syenitica*)
332 (148) Eastern Great Reed Warbler (*Acrocephalus arundinaceus orientalis*)
353 (171) Brown-backed Warbler (*Agrobates galactotes syriacus*)
380 (92) Masked Wagtail (*Motacilla alba personata*)
384 (115) South European Grey Shrike (*Lanius excubitor meridionalis*)
386 (117) Corsican Woodchat Shrike (*Lanius senator badius*)

*There is one other Alpine Ring Ouzel, apart from the one in Appendix A, and that was a female shot near Brighton, Sussex, on 29th March 1913 (*Brit. Birds*, 7: 117); we have no direct evidence that it was connected with the Hastings Rarities, but as the record is similarly lacking in information, and as it was published by J. B. Nichols for whom it provided a mate for the Hastings male already in his possession, we think it is better discarded.

421 (56) Western Large-billed Reed Bunting (*Emberiza schoeniclus compilator*)

421 (57) Eastern Large-billed Reed Bunting (*Emberiza schoeniclus tschusii*)

(c) That the occurrences marked with an asterisk in Appendix A and Appendix B be deleted from *The Handbook,* subject to reinstatement where a particular case is made out.

(d) That all the remaining records listed in Appendix A and Appendix B be discarded, again subject to reinstatement where a particular case is made out.

ACKNOWLEDGEMENTS

Above all, we are deeply indebted to Miss Janet M. Barnes who has played a major part in the compilation of the appendices, doing much of the detailed checking of references as well as all the actual typing; it is probable that without her assistance the task would never have been completed.

It is nearly eight years since we began our researches in this field and in that time we have had help from many people. J. A. Nelder's co-operation (as well as patience) has been a tower of strength, and the detailed suggestions and criticisms we have received from D. D. Harber and G. des Forges at intervals over the years have proved invaluable; during the same period these two have been working on a new book on Sussex birds, which will be published this autumn, and it is pleasant to be able to record that they agree completely with the conclusions set out in this paper, at least in so far as they affect Sussex. Kent records play a comparatively small part in the Hastings picture—less than one fifth of the whole—but we consulted E. H. Gillham, then editor of the *Kent Bird Report*, at an early stage. P. A. D. Hollom has been a constant source of advice and encouragement from the very beginning and his faith in our conclusions was such that, long before the full analysis was completed, he discarded all the Hastings Rarities from his *The Popular Handbook of Rarer British Birds* (1960).

The late Alfred Hazelwood read the paper in draft and was able to make a number of valuable suggestions in his capacity as Curator to the Bolton Museums and Art Gallery (where several of the specimens eventually came to roost). Similar advice and the fullest co-operation was also received from H. F. Brazenor, Deputy Director of Brighton Art Gallery and Museum, who kindly carried out a detailed examination of some of the rarest skins concerned, and from J. Manwaring Baines, Curator of Hastings Public Museum and Art Gallery, who was able to supply much local history in addition to showing us round the Hastings collection.

Through the good offices of Sir Landsborough Thomson and with the assistance of Dr. Franklin Kidd and Mr. E. Barlow Wright, we were put in touch with Dr. J. Brooks of the Low Temperature Research Station at Cambridge and from him received valuable advice on the questions of refrigeration and chilling. Holger Holgersen and Dr. Gunnar Svärdson gave us detailed information on the movements of Pine Grosbeaks in Fenno-Scandia since the end of the nineteenth century. Much useful background on the records was supplied by H. G. Alexander, C. D. Borrer, Rev. S. G. Brade-Birks, Dr. James M. Harrison, Col. R. Meinertzhagen, R. E. Moreau, Lt.-Col. J. K. Stanford, Dr. N. F. Ticehurst and the Hon. Mrs. J. Whistler—not all of whom, however, may necessarily agree with our conclusions. We are grateful to H. W. Ford-Lindsay for granting us an interview in 1955 and to the Director of the Giza Zoological Gardens in Cairo for instituting a search for the late M. J. Nicoll's diaries. Robert Gillmor went to considerable trouble to draw the map on pages 332-333. Stanley Cramp, D. G. Andrew, Dr. J. S. Ash and R. K. Cornwallis read the paper at various stages and we thank them for their support and suggestions. Others who have helped in divers ways include Ralph Chislett, R. S. R. Fitter, Dr. David Lack and the late Sir Norman Kinnear.

Last, but by no means least, we owe a very great debt to the extraordinarily full county avifaunas by Walpole-Bond (1938) and Harrison (1953), without which the task of analysing the records would have been far harder.

REFERENCES

This list is confined to books and recently published papers referred to in the discussion. It would be both tedious and unnecessary to give full references for the innumerable notes and articles on rare birds in the Hastings Area, which appeared in *British Birds,* the *Bulletin of the British Ornithologists' Club* and *The Hastings and East Sussex Naturalist* (and to a lesser extent *The Zoologist* and *The Ibis*) during the period concerned. These are cited in abbreviated form in Appendices A and B and, where necessary, in the text.

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Addendum

Our colleague Dr. N. F. Ticehurst has now provided additional information to show that the White-spotted Bluethroat found dead at St. Leonards, Sussex, on 22nd September 1912 (no. 384 in Appendix A) can be regarded as a valid record. Therefore, in accordance with the recommendation under (d) on page 343, we propose that this be reinstated. As already pointed out, Appendices A and D almost certainly contain several authentic records and we hope that anyone else with particular knowledge will try to pinpoint those which should be upheld.

Appendices

Appendix A—Unacceptable records of birds

This appendix is a complete list of the birds which were allegedly shot or found dead in the period concerned, and which there is now no positive reason to believe are acceptable. It includes all those from the Hastings Area as defined on page 301—a radius of twenty miles from Hastings Pier plus the rest of Romney Marsh, but excluding localities to the west of Pevensey Levels—and it also takes in one or two suspect ones which fall just outside it (e.g. the Snow Finches at Paddock Wood). The species and races involved are basically the same as those used in J. A. Nelder's analysis on pages 283-298, but a few have been deleted and some others added. The deletions fall into two categories (bearing in mind that some of the birds on his list do not concern us here anyway because they occurred solely outside the period and area): (1) Kite, Red-necked Phalarope, Pomarine Skua, Long-tailed Skua, Roseate Tern, Black Guillemot, Red-spotted Bluethroat, Water Pipit, "Sykes's" Wagtail and Northern Bullfinch, which have been taken out because they are (or were) too numerous or regular in some part of the British Isles to rank as rarities in this particular context; and (2) Purple Heron which has been omitted because the only record is not suspect. The additions fall into three groups: (1) Little Bittern and Alpine Swift, which do form part of the Hastings picture but were left out by Nelder because the number of records took them outside his class III; (2) Little Ringed Plover, which was a very rare vagrant at that time although it has since colonised many parts of England; and (3) Egyptian Black Kite, Wilson's Phalarope, Slender-billed Gull, Royal Tern, Noddy Tern, Great Spotted Cuckoo, Belted Kingfisher, Three-toed Woodpecker, Indian Golden Oriole and Long-tailed Rose Finch, none of which was ever accepted, in some cases because they came after 1916 (see page 336), but which are also an integral part of the whole canvas. Birds in this last group are shown in square brackets and there are a number of individual records of other species in the same position (e.g. the Hollington Olivaceous Warblers which were not accepted by the authors of *The Handbook* simply because the conditions laid down in 1916 were not complied with). Some records for which there is supporting field evidence or which clearly had no connection with the Hastings group have been weeded out. Where two or more records are connected, these are shown with a linking bracket after the English name or, in certain cases, by bold dates. Doubtless the list still contains a number of valid records, and the occurrences of such species as Glossy Ibis, Little Bittern, Little Crake, Great Snipe, Sabine's Gull, Gull-billed Tern, Bee-eater, Roller and Woodchat Shrike (and the autumn

No.	*Bird*	*Date*	*Locality*	*Age/Sex*
1	*Wilson's Petrel	2.12.14	St. Leonards *S*	♂
2	[Wilson's Petrel	30.10.16	nr Bexhill *S*	♂
3	*Madeiran Petrel	5.12.95	Littlestone *K*	♀
4	[Madeiran Petrel	26.11.05	St. Leonards *S*	1

ned" in the Hastings Area between 1892 and 1930

awny Pipits) fit quite well into the general pattern for south-east England ver the last hundred years. However, in order to achieve consistency, a rigid ne of division had to be drawn between inclusion and exclusion.

The consecutive numbers in the first column are a means of cross-reference om Appendix C and elsewhere. An asterisk signifies that the record is to e found in *The Handbook*, though sometimes only in summarised form. The cientific names of both species and races are given in Appendix D. All calities are shown in Fig. 1 and are included here with the letters *S* or *K* to dicate county. In this connection, it should be pointed out that during the arly part of the present century there was some confusion over where the ounty boundary actually fell, partly because the parish of Broomhill was ansferred from Kent to Sussex as late as 1895; as a result, most records from ne area now known as the Midrips and from the adjacent part of Jury's Gap ewer were formerly treated under Kent by everybody concerned, including Valpole-Bond (1938) and Harrison (1953) (see des Forges and Harber 1953). ll records from these areas are given here, therefore, as "Jury's Gap *S*". In ne "Age/Sex" column, birds are divided into the somewhat arbitrary categories f "adult" and "immature" if sufficient detail was recorded, and the figure 1 used only where there is no information on age or sex. In the "Shot by" olumn the exact wording of the original record has been kept in the comaratively small number of cases where a name or other identification was ublished, but the not infrequent and vague references to "a man" have been mitted; where a bird was allegedly found dead or washed ashore, this is ated in brackets (and the abbreviation "telegraphed" covers those that were corded as killed by telegraph wires). The next three columns show the ames (as far as this information is available) of those who saw the bird in the esh and subsequently recorded it in print. Some of these are referred to by rnames alone because of the frequency with which they occur. They are . Bristow, W. Ruskin Butterfield, L. A. Curtis Edwards, H. W. Ford-Lindsay, B. Nichols, M. J. Nicoll and T. Parkin. The final column in the appendix tes the most informative reference in each case (sometimes a bird was recorded four or five different places). The following abbreviations have been used r the references: BB, *British Birds*; BBOC, *Bulletin of the British Ornithologists' lub*; HESN, *The Hastings and East Sussex Naturalist*; Z, *The Zoologist*; I, *The is*; DRC, *Catalogue of Cases of Birds in the Dyke Road Museum, Brighton* (1927); -B, Walpole-Bond (1938); H, Harrison (1953); and T, Ticehurst (1909).

"	*Sent to*	*Examined by*	*Recorded by*	*Reference*
ashore)		Ford-Lindsay Butterfield	Ford-Lindsay	BB, 8: 199 HESN, 4: 33]
dead)	Bristow	Alexander, B. & Ticehurst, N. F.	Saunders, H.	BBOC, 5: 37
dead by a an on at)	Bristow (per Mr. Farley)			HESN, 4: 33]

No.	*Bird*	*Date*	*Locality*	*Age/Sex*
5	*Madeiran Petrel	8.11.06	nr Hythe *K*	♀
6	Balearic Shearwater	27.12.15	Pevensey Sluice *S*	♂
7	*Little Shearwater	28.12.00	nr Bexhill *S*	♀
8	*Madeiran Little Shearwater	27.11.05	nr Lydd *K*	♂
9	*Madeiran Little Shearwater	27.10.11	St. Leonards *S*	♀
10	*Madeiran Little Shearwater	15.11.11	Pevensey Sluice *S*	♂
11	*Madeiran Little Shearwater	27.12.13	Jury's Gap *S*	♀
12	[Madeiran Little Shearwater	**9. 3.23**	Jury's Gap *S*	♂
13	*Cape Verde Little Shearwater	4.12.14	Pevensey *S*	♀
14	*Cape Verde Little Shearwater	2. 1.15	St. Leonards *S*	♀
15	[Cape Verde Little Shearwater	**9. 3.23**	Jury's Gap *S*	♂
16	Great Shearwater	19.10.07	Pevensey *S*	1
17	Great Shearwater	24.10.11	Stone-in-Oxney *K*	♂
18	Great Shearwater	27.12.12	Shoreham *S*	1
19	*Mediterranean Shearwater	21. 2.06	Pevensey *S*	♀
20	Mediterranean Shearwater	19.10.08	Pevensey *S*	1
21	North Atlantic Shearwater	21. 1.01	Dungeness *K*	♀
22	*North Atlantic Shearwater	14. 3.14	Bulverhythe *S*	♂
23	[North Atlantic Shearwater	9.11.20	Pevensey Sluice *S*	♀
24	*Bulwer's Petrel	4. 2.04	nr St. Leonards *S*	♀
25	*Bulwer's Petrel	4. 9.08	Pett *S*	♂
26	*Bulwer's Petrel	24.10.11	Pevensey *S*	♂
27	*Bulwer's Petrel	16. 3.14	Jury's Gap *S*	♂
28	Squacco Heron	16.10.01	Pett Level *S*	♀
29	Squacco Heron	25.10.01	Pett Level *S*	ad. ♂
30	Squacco Heron	19. 6.03	East Guldeford *S*	ad. ♀
31	Squacco Heron	22. 6.03	nr Winchelsea *S*	♂
32	Squacco Heron	3. 6.05	nr Rye *S*	1
33	Squacco Heron	29. 5.07	Romney Marsh *K*	♂
34	Squacco Heron	29. 5.07	Romney Marsh *K*	♀
35	Squacco Heron	13.11.13	Winchelsea *S*	imm. ♂
36	Squacco Heron	0. 4.14	Romney Marsh *K*	♂
37	Squacco Heron	10. 8.24	Rye *S*	imm. ♂
38	Night Heron	11. 5.97	Pett Level *S*	1
39	Night Heron	4. 6.00	Brookland *K*	ad. ♂
40	Night Heron	24. 9.04	Pevensey *S*	1
41	Night Heron	28. 9.04	Newenden *K*	imm.
42	Night Heron	3.10.06	nr Lydd *K*	imm. ♂
43	Night Heron	20. 3.13	Little Common *S*	imm. ♂
44	Night Heron	10. 5.18	Pevensey *S*	1
45	Little Bittern	8. 6.98	Romney Marsh *K*	1
46	Little Bittern	19. 5.01	Winchelsea *S*	ad. ♂
47	Little Bittern	0. 5.04	nr Winchelsea *S*	ad.
48	Little Bittern	23. 5.14	nr Winchelsea *S*	ad. ♂
49	Little Bittern	0. 5.21	nr Lydd *K*	♂
50	*American Bittern	29. 1.18	Rye *S*	1
51	Glossy Ibis	7. 5.17	Winchelsea *S*	1

,"	*Sent to*	*Examined by*	*Recorded by*	*Reference*
	Bristow	Ticehurst, N. F.	Ticehurst, N. F.	BBOC, 19: 20
	Bristow			W-B, 3: 66
exhausted)	Bristow	Butterfield	Butterfield	BBOC, 11: 45
alive by Mr.	Bristow	Ticehurst, N. F.	Ticehurst, C. B.	BBOC, 16: 38
died 29.11.05)				
d ashore)	Bristow		Ford-Lindsay	BB, 5: 253
			Witherby, H. F.	BB, 5: 253
	Bristow	Ford-Lindsay	Nichols	BB, 9: 212
			Ticehurst, N. F.	HESN, 3: 262]
dead)	Bristow	Ford-Lindsay	Nichols	BB, 9: 201
alive, died		Ford-Lindsay	Nichols	BB, 9: 201
			Butterfield	HESN, 3: 262]
	Bristow			W-B, 3: 69
exhausted)			Ticehurst, N. F.	BB, 6: 21
	Bristow			W-B, 3: 69
dead by a man	Bristow	Butterfield	Butterfield	BBOC, 16: 71
Jenner)				
	Bristow		Bristow	W-B, 3: 70
d ashore)				H, 1: 77
d ashore)	Bristow	Butterfield	Nichols	BB, 9: 203
				HESN, 4: 34]
dead)		Butterfield	Butterfield	BBOC, 14: 49
alive)	Bristow	Butterfield	Witherby, H. F.	BB, 2: 282
dead)	Bristow		Ford-Lindsay	BB, 5: 198
		Ford-Lindsay & Butterfield	Nichols	BB, 8: 13
herd	Bristow		Ticehurst, N. F.	BBOC, 12: 29
			Ticehurst, N. F.	BBOC, 12: 29
			Ticehurst, N. F.	Z, 1903: 421
			Ticehurst, N. F.	Z, 1903: 421
			Nichols	Z, 1905: 349
				W-B, 2: 342
				W-B, 2: 342
		Ford-Lindsay	Ford-Lindsay	BB, 7: 234
				H, 1: 101
	Bristow		Bristow	HESN, 4: 31
	Bristow		Bristow	W-B, 2: 343
	Bristow			H, 1: 102
			Nichols	Z, 1905: 267
	Bristow			H, 1: 102
l huckster	Bristow			H, 1: 103
Butler				
				HESN, 2: 99
				HESN, 3: 2
				H, 1: 104
ep-dog with a	Bristow		Bristow	W-B, 2: 346
amed Masters)				
g)			Ticehurst, N. F.	BB, 1: 349
			Mullens, W. H.	HESN, 2: 200
				H, 1: 104
				HESN, 3: 3
				HESN, 3: 78

No.	*Bird*	*Date*	*Locality*	*Age/Sex*
52	Glossy Ibis	22.11.22	Broomhill *S*	imm. ♂
53	*Red-crested Pochard	17. 1.11	Boreham Bridge *S*	♂
54	*Red-crested Pochard	17. 1.11	Boreham Bridge *S*	♀
55	*Red-crested Pochard	17. 1.11	Boreham Bridge *S*	♀
56	*Red-crested Pochard	5. 2.11	Boreham Bridge *S*	♂
57	*Red-crested Pochard	10. 2.11	Boreham Bridge *S*	♂
58	*Ferruginous Duck	2. 1.12	Crowhurst *S*	♂
59	*Ferruginous Duck	2. 1.12	Crowhurst *S*	♀
60	*Ferruginous Duck	24. 4.14	Pett Level *S*	♀
61	[Ferruginous Duck	10. 1.25	Romney Marsh *K*	♂
62	*King Eider	10.11.15	Dungeness *K*	imm. ♂
63	Ruddy Shelduck	0. 3.03	Cranbrook *K*	1
64	Ruddy Shelduck	14.11.05	Jury's Gap *S*	♀
65	Ruddy Shelduck	0.11.05	Jury's Gap *S*	♂
66	Ruddy Shelduck	0. 5.18	Jury's Gap *S*	ad. ♂
67	Ruddy Shelduck	12. 5.18	Rye *S*	1
68	Goshawk	19.11.04	Hooe *S*	imm. ♀
69	Goshawk	30.10.05	Pett *S*	♂
70	Goshawk	30.10.05	Pett *S*	♀
71	[Egyptian Black Kite	12. 5.07	Kent	1
72	Red-footed Falcon	0. 8.95	Dungeness *K*	♂
73	Red-footed Falcon	0. 0.96	Fairlight *S*	1
74	Red-footed Falcon	15. 4.99	Hooe *S*	imm. ♂
75	Red-footed Falcon	3. 6.01	nr Pett *S*	1
76	Red-footed Falcon	0. 0.01	nr Rye *S*	1
77	Red-footed Falcon	12. 9.03	Hooe *S*	1
78	Red-footed Falcon	12. 9.03	Hooe *S*	1
79	Red-footed Falcon	0. 0.03	St. Leonards *S*	1
80	Red-footed Falcon	10. 6.08	nr Ashford *K*	ad. ♀
81	Red-footed Falcon	17. 5.20	Crowhurst *S*	1
82	Red-footed Falcon	2. 9.24	Wadhurst *S*	♀
83	Red-footed Falcon	before.15	nr Robertsbridge *S*	ad. ♂
84	*Lesser Kestrel	8. 5.96	Hollington *S*	ad. ♂
85	*Lesser Kestrel	7. 4.14	Staple Cross *S*	imm. ♂
86	Baillon's Crake	24.11.06	nr Lydd *K*	♀
87	Baillon's Crake	0. 6.07	Pett *S*	1
88	Baillon's Crake	1907-08	St. Leonards *S*	several
89	Little Crake	30. 6.95	Whatlington *S*	1
90	Little Crake	7. 5.04	Pevensey *S*	ad. ♂
91	Little Crake	0. 6.04	nr Rye *S*	1
92	Little Crake	19. 7.13	St. Leonards *S*	♀
93	Little Crake	25. 7.13	St. Leonards *S*	♂
94	Little Crake	2. 6.18	nr Rye *S*	1
95	Little Crake	1. 6.21	Pevensey Levels *S*	1
96	Eastern Little Bustard	2. 1.00	Newenden *K*	♀
97	Eastern Little Bustard	28.12.00	Ashburnham *S*	1
98	Eastern Little Bustard	8. 2.02	Hollington *S*	♀
99	Eastern Little Bustard	26.12.05	Westfield *S*	♀

by"	*Sent to*	*Examined by*	*Recorded by*	*Reference*
				HESN, 4: 4
	Bristow		Ford-Lindsay	BB, 4: 316
	Bristow		Ford-Lindsay	BB, 4: 316
				W-B, 3: 20
	Bristow		Ford-Lindsay	BB, 4: 316
				W-B, 3: 20
		Ford-Lindsay	Ford-Lindsay	BB, 5: 247
		Ford-Lindsay	Ford-Lindsay	BB, 5: 247
			Mullens, W. H.	HESN, 2: 172
	Bristow		Bristow	HESN, 4: 33]
ed ashore)		Ford-Lindsay & Butterfield	Ford-Lindsay	BB, 9: 252
				H, 1: 191
named	Bristow			H, 1: 191
rden				
l dead by a named Standen)	Bristow			H, 1: 191
				H, 1: 191
				HESN, 3: 3
e Sargeant	Bristow			HESN, 1: 305
				W-B, 2: 295
				W-B, 2: 295
	Bristow	Ticehurst, N. F.	Ticehurst, N. F.	H, 1: 235]
			Ticehurst, N. F.	H, 1: 261
			Parkin	W-B, 2: 275
e Sargeant, ner	Bristow	Nicoll	Coombe, P. E.	W-B, 2: 275
			Field, W.	W-B, 2: 275
	Bristow	Nicoll		W-B, 2: 275
			Nichols	W-B, 2: 276
			Nichols	W-B, 2: 276
	Bristow	Nicoll		W-B, 2: 275
a keeper	Bristow	Ticehurst, N. F.		H, 1: 261
			Butterfield	HESN, 3: 164
	Bristow		Bristow	HESN, 4: 30
ekeeper			Butterfield	HESN, 2: 172
			Ticehurst, N. F.	BB, 1: 322
		Ford-Lindsay	Nichols	BB, 9: 97
	Bristow	Ticehurst, N. F.		H, 1: 289
raphed)			Ticehurst, N. F.	BB, 1: 359
)			Nicoll	W-B, 3: 336
; with a Mr.			Parkin	Z, 1895: 309
erd)				W-B, 3: 334
)			Ticehurst, N. F.	BB, 2: 129
)		Ford-Lindsay	Ford-Lindsay	BB, 7: 120
	Bristow		Ford-Lindsay	BB, 7: 120
)			Andrews, W. H.	HESN, 3: 3
				HESN, 3: 215
			Ticehurst, N. F.	H, 1: 298
			Bradshaw, G. W.	Z, 1900: 428
raphed)			Ticehurst, N. F.	BB, 2: 148
			Ticehurst, N. F.	BB, 2: 148

No.	*Bird*	*Date*	*Locality*	*Age/Sex*
100	Eastern Little Bustard	11. 9.09	Pevensey *S*	1
101	Eastern Little Bustard	21.10.11	Beckley *S*	♀
102	Eastern Little Bustard	28.10.12	Icklesham *S*	1
103	Eastern Little Bustard	27.12.13	Icklesham *S*	♂
104	Eastern Little Bustard	4. 4.19	Jury's Gap *S*	♂
105	Eastern Little Bustard	21. 9.25	Wartling *S*	♀
106	*Sociable Plover	3. 5.07	Romney Marsh *K*	imm. ♀
107	*Sociable Plover	25. 5.10	nr Winchelsea *S*	♀
108	*Sociable Plover	26. 5.10	nr Winchelsea *S*	♂
109	*Sociable Plover	26. 5.10	nr Winchelsea *S*	♀
110	*Sociable Plover	27. 5.10	nr Winchelsea *S*	♂
111	*Sociable Plover	9. 5.14	nr Winchelsea *S*	1
112	*Sociable Plover	11. 5.14	nr Winchelsea *S*	♂
113	*Sociable Plover	18. 5.14	nr Winchelsea *S*	♂
114	*Semipalmated Ringed Plover	8. 4.16	Rye *S*	♀
115	[Little Ringed Plover	spring.99	Brookland *K*	ad. ♂
116	*Little Ringed Plover	18. 4.14	Rye *S*	♂
117	*Little Ringed Plover	1. 5.22	Cooden *S*	1
118	*Killdeer	20. 4.08	Romney Marsh *K*	1
119	*Killdeer	21. 4.08	Romney Marsh *K*	ad.
120	*Killdeer	22. 4.08	Romney Marsh *K*	♂
121	*Killdeer	12.11.15	nr Winchelsea *S*	♂
122	*Killdeer	12.11.15	nr Winchelsea *S*	♀
123	[Killdeer	29. 8.19	Broomhill *S*	1
124	*Caspian Plover	13. 7.11	Brenzett *K*	ad. ♂
125	*Caspian Plover	13. 7.11	Brenzett *K*	ad. ♀
126	*Caspian Plover	30. 3.14	Pevensey *S*	♂
127	*American Golden Plover	22. 9.16	Rye *S*	♀
128	*Asiatic Golden Plover	23. 4.14	Wartling Marsh *S*	♂
129	*Asiatic Golden Plover	23. 4.14	Wartling Marsh *S*	♀
130	*Asiatic Golden Plover	23. 4.14	Wartling Marsh *S*	♀
131	*Asiatic Golden Plover	20. 9.15	Romney Marsh *K*	♂
132	*Asiatic Golden Plover	20. 9.15	Romney Marsh *K*	♀
133	*Asiatic Golden Plover	20. 9.15	Romney Marsh *K*	♀
134	*Asiatic Golden Plover	20. 9.15	Romney Marsh *K*	4+ others
135	*Dowitcher	15. 8.07	Littlestone *K*	♂
136	*Dowitcher	2. 5.12	Rye *S*	♂
137	Great Snipe	15.11.99	Winchelsea *S*	1
138	Great Snipe	29. 8.03	Brede *S*	1
139	Great Snipe	5.10.06	Brookland *K*	1
140	*Upland Sandpiper	18. 7.08	nr Lydd *K*	♂
141	*Upland Sandpiper	3. 7.14	St. Leonards *S*	♂

')"	*Sent to*	*Examined by*	*Recorded by*	*Reference*
			Bryden, H. A.	W-B, 3: 323
			Nichols	BB, 5: 226
	Bristow			W-B, 3: 323
	Bristow	Ford-Lindsay	Ford-Lindsay	BB, 7: 270
	Bristow	Ticchurst, N. F.	Ticehurst, N. F.	HESN, 3: 133
	Bristow		Bristow	HESN, 4: 38
herd	Bristow	Ticehurst, C. B.	Ticehurst, C. B.	BBOC, 19: 85
named Thorpe	Bristow	Butterfield & Edwards	Griffith, A. F.	BBOC, 27: 28
named Thorpe	Bristow	Butterfield & Edwards	Griffith, A. F.	BBOC, 27: 28
named Thorpe	Bristow	Butterfield & Edwards	Griffith, A. F.	BBOC, 27: 28
named Thorpe	Bristow	Butterfield & Edwards	Griffith, A. F.	BBOC, 27: 28
		Butterfield	Nichols	BB, 9: 157
		Butterfield	Nichols	BB, 9: 157
		Butterfield	Nichols	BB, 9: 157
	Bristow	Parkin	Parkin	BB, 10: 254
	Gasson & Bristow			H, 1: 312]
		Butterfield	Nichols	BB, 9: 97
		Butterfield		HESN, 3: 262
herd	Bristow	Ticchurst, N. F.	Ticehurst, N. F.	BB, 2: 169
den	Bristow		Ticehurst, N. F.	BB, 2: 169
den	Bristow	Butterfield	Carroll, C. J.	BBOC, 23: 25
		Ford-Lindsay	Ford-Lindsay	BB, 9: 212
		Ford-Lindsay	Ford-Lindsay	BB, 9: 212
		Butterfield		HESN, 3: 131]
	Bristow	Ford-Lindsay	Ford-Lindsay	BB, 5: 115
	Bristow	Ford-Lindsay	Ford-Lindsay	BB, 5: 115
		Ford-Lindsay	Nichols	BB, 8: 13
clfc		Nichols & Butterfield	Nichols	BB, 11: 45
	Bristow	Parkin	Parkin	BB, 8: 52
	Bristow	Parkin	Parkin	BB, 8: 52
	Bristow	Parkin	Parkin	BB, 8: 52
	Bristow	Ford-Lindsay	Ford-Lindsay	BB, 9: 212
	Bristow	Ford-Lindsay	Ford-Lindsay	BB, 9: 212
	Bristow	Ford-Lindsay	Ford-Lindsay	BB, 9: 212
	Ford-Lindsay (wings only)	Ford-Lindsay	Ford-Lindsay	BB, 9: 212
	Bristow		Ticehurst, N. F.	BB, 1: 231
			Parkin	BB, 6: 95
				HESN, 1: 206
			Ticehurst, N. F.	Z, 1903: 421
mes		Ticchurst, N. F.		H, 1: 336
	Bristow	Nicoll	Nicoll	BB, 2: 206
aphed)		Ford-Lindsay	Ford-Lindsay	BB, 8: 101

No.	*Bird*	*Date*	*Locality*	*Age/Sex*
142	*Slender-billed Curlew	21. 9.10	nr Brookland *K*	imm. ♂
143	*Slender-billed Curlew	21. 9.10	nr Brookland *K*	imm. ♀
144	*Slender-billed Curlew	23. 9.10	nr Brookland *K*	ad. ♂
145	*Slender-billed Curlew	10. 9.14	Jury's Gap *S*	imm. ♂
146	*Slender-billed Curlew	18. 5.19	Pevensey Sluice *S*	1
147	*Slender-billed Curlew	18. 5.19	Pevensey Sluice *S*	1
148	*Solitary Sandpiper	7. 8.04	Rye Harbour *S*	1
149	*Solitary Sandpiper	15. 8.08	Littlestone *K*	♀
150	*Solitary Sandpiper	17. 4.14	Pevensey *S*	♀
151	*Solitary Sandpiper	30. 5.16	nr Pevensey *S*	♀
152	*Spotted Sandpiper	5. 5.04	Romney Marsh *K*	ad. ♂
153	*Spotted Sandpiper	5. 5.04	Romney Marsh *K*	ad. ♀
154	*Spotted Sandpiper	22. 5.13	Pevensey Sluice *S*	ad. ♂
155	*Spotted Sandpiper	24. 5.13	Pevensey Sluice *S*	♀
156	*Spotted Sandpiper	17. 5.18	Rye *S*	1
157	[Spotted Sandpiper	13. 5.20	Pevensey *S*	♂
158	[Spotted Sandpiper	13. 5.20	Pevensey *S*	♀
159	[Spotted Sandpiper	13. 5.20	Pevensey *S*	♀
160	*Greater Yellowlegs	4.10.15	Winchelsea *S*	♀
161	*Lesser Yellowlegs	15. 8.14	Camber *S*	imm. ♂
162	*Lesser Yellowlegs	15. 8.14	Camber *S*	ad. ♀
163	*Marsh Sandpiper	16. 6.09	nr Rye *S*	ad. ♀
164	*Marsh Sandpiper	18. 6.09	nr Rye *S*	ad. ♂
165	*Marsh Sandpiper	1. 7.10	Bodiam Marsh *S*	♀
166	*Marsh Sandpiper	24. 5.15	Romney Marsh *K*	♂
167	*Marsh Sandpiper	24. 5.15	Romney Marsh *K*	♀
168	*Grey-rumped Sandpiper	23. 9.14	Rye Harbour *S*	ad. ♂
169	*Grey-rumped Sandpiper	27. 9.14	Rye Harbour *S*	ad. ♀
170	*Terek Sandpiper	23. 5.12	Brookland *K*	♂
171	*Terek Sandpiper	23. 5.12	Brookland *K*	♀
172	*Terek Sandpiper	24. 5.12	Brookland *K*	♂
173	*Terek Sandpiper	25. 5.12	Brookland *K*	♀
174	*Terek Sandpiper	26. 5.15	Rye Harbour *S*	♂
175	*Terek Sandpiper	28. 5.15	Rye Harbour *S*	♂
176	*Terek Sandpiper	28. 5.15	Rye Harbour *S*	♀
177	*Baird's Sandpiper	11.10.00	Rye Harbour *S*	imm. ♀
178	*Baird's Sandpiper	16. 9.12	Rye Harbour *S*	♀
179	*Baird's Sandpiper	23. 9.14	Rye Harbour *S*	ad. ♂
180	[White-rumped Sandpiper	4. 8.01	Rye *S*	1
181	*White-rumped Sandpiper	4. 6.06	Jury's Gap *S*	ad. ♂
182	*White-rumped Sandpiper	14. 4.16	Rye Harbour *S*	♂
183	*Pectoral Sandpiper	2. 8.98	Romney Marsh *K*	ad. ♂
184	*Pectoral Sandpiper	19. 9.06	Rye Harbour *S*	ad.
185	*Pectoral Sandpiper	14. 4.09	Winchelsea *S*	♂
186	*Pectoral Sandpiper	17. 4.09	Winchelsea *S*	♀
187	*Pectoral Sandpiper	25. 8.14	Pevensey *S*	imm. ♀
188	*Pectoral Sandpiper	6. 8.15	Rye *S*	ad. ♀
189	[Pectoral Sandpiper	19.10.29	Rye *S*	1

	Sent to	*Examined by*	*Recorded by*	*Reference*
		Nicoll	Nicoll	BB, 5: 124
		Nicoll	Nicoll	BB, 5: 124
		Nicoll	Nicoll	BB, 5: 124
		Ford-Lindsay	Ford-Lindsay	BB, 8: 150
		Butterfield		HESN, 3: 132
		Butterfield		HESN, 3: 132
named Peters	Bristow	Ticehurst, N. F.	Ticehurst, C. B.	BBOC, 15: 12
tor	Bristow	Ticehurst, N. F.	Ticehurst, N. F.	BB, 2: 170
		Nichols	Nichols	BB, 8: 15
	Bristow	Butterfield & Ford-Lindsay	Nichols	BB, 12: 93
ker	Bristow	Ticehurst, N. F.	Bonhote, J. L.	BBOC, 14: 84
ker	Bristow	Ticehurst, N. F.	Bonhote, J. L.	BBOC, 14: 84
	Bristow	Ford-Lindsay	Ford-Lindsay	BB, 7: 58
	Bristow	Ford-Lindsay	Ford-Lindsay	BB, 7: 58
				HESN, 3: 3
		Butterfield		HESN, 3: 167]
		Butterfield		HESN, 3: 167]
		Butterfield		HESN, 3: 167]
		Ford-Lindsay	Ford-Lindsay	BB, 9: 213
		Ford-Lindsay	Ford-Lindsay	BB, 8: 121
		Ford-Lindsay	Ford-Lindsay	BB, 8: 121
		Nicoll & Edwards	Nicoll	BB, 3: 356
		Nicoll & Edwards	Nicoll	BB, 3: 356
		Butterfield	Nichols	BB, 5: 49
			Ford-Lindsay	BB, 9: 69
			Ford-Lindsay	BB, 9: 69
		Ford-Lindsay	Ford-Lindsay	BB, 9: 205
		Ford-Lindsay	Ford-Lindsay	BB, 9: 205
	Bristow	Parkin	Parkin	BB, 6: 74
	Bristow	Parkin	Parkin	BB, 6: 74
	Bristow	Butterfield	Parkin	BB, 6: 74
	Bristow	Butterfield	Parkin	BB, 6: 74
		Parkin	Parkin	BB, 9: 69
		Butterfield	Parkin	BB, 9: 69
		Butterfield	Parkin	BB, 9: 69
		Butterfield	Hartert, E.	BBOC, 11: 27
		Ford-Lindsay	Ford-Lindsay	BB, 6: 193
		Ford-Lindsay	Ford-Lindsay	BB, 8: 174
				W-B, 3: 174]
		Nicoll	Ticehurst, N. F.	BB, 1: 231
		Butterfield	Nichols	BB, 11: 68
			Ticehurst, N. F.	BBOC, 8: 6
	Bristow		Ticehurst, N. F.	BB, 1: 230
		Nichols	Nichols	BB, 3: 339
		Edwards	Nichols	BB, 3: 339
	Bristow	Ford-Lindsay	Ford-Lindsay	BB, 8: 148
	Bristow	Ford-Lindsay & Butterfield	Ford-Lindsay	BB, 9: 97
	Bristow		Bristow	HESN, 4: 85]

No.	*Bird*	*Date*	*Locality*	*Age/Sex*
190	*Semipalmated Sandpiper	17. 9.07	Jury's Gap *S*	imm.
191	*Broad-billed Sandpiper	2.10.95	Rye *S*	1
192	*Broad-billed Sandpiper	2. 9.96	Rye *S*	1
193	*Broad-billed Sandpiper	6. 9.96	Dungeness *K*	imm. ♀
194	*Broad-billed Sandpiper	31. 8.01	Littlestone *K*	imm. ♀
195	*Broad-billed Sandpiper	14. 9.01	nr Bexhill *S*	1
196	*Broad-billed Sandpiper	29. 8.04	Rye *S*	imm. ♀
197	*Broad-billed Sandpiper	3. 9.09	Rye *S*	♀
198	Black-winged Stilt	9.10.10	Crowhurst *S*	imm. ♂
199	Black-winged Stilt	15. 9.13	Lydd *K*	imm. ♀
200	Black-winged Stilt	20. 9.13	Lydd *K*	imm. ♂
201	Black-winged Stilt	6. 5.20	Broomhill *S*	♂
202	Black-winged Stilt	8. 5.20	Broomhill *S*	♀
203	[Wilson's Phalarope	1. 5.25	nr Winchelsea *S*	ad. ♀
204	Pratincole	30. 5.03	Jury's Gap *S*	ad. ♂
205	Pratincole	19. 7.04	Jury's Gap *S*	ad.
206	Pratincole	19. 7.04	Jury's Gap *S*	ad.
207	Pratincole	19. 9.04	nr Rye *S*	1
208	Pratincole	5. 6.05	Rye *S*	1
209	Pratincole	21. 4.06	Boreham Street *S*	1
210	Pratincole	22. 5.19	Pevensey Sluice *S*	1
211	*Black-winged Pratincole	30. 5.03	Romney Marsh *K*	♂
212	*Black-winged Pratincole	17. 6.03	Romney Marsh *K*	1
213	*Black-winged Pratincole	18. 7.03	Rye Harbour *S*	♀
214	*Black-winged Pratincole	30. 4.13	nr Rye *S*	♂
215	*Black-winged Pratincole	1. 5.13	nr Rye *S*	♂
216	*Black-winged Pratincole	1. 5.13	nr Rye *S*	♀
217	*Black-winged Pratincole	3. 5.13	nr Rye *S*	♀
218	*Cream-coloured Courser	5. 5.11	nr Wartling *S*	♂
219	*Cream-coloured Courser	5. 5.11	nr Wartling *S*	♀
220	*Cream-coloured Courser	21. 2.13	Jury's Gap *S*	♂
221	*Cream-coloured Courser	21. 2.13	Jury's Gap *S*	ad. ♀
222	[Cream-coloured Courser	15. 8.20	Pevensey *S*	1
223	Ivory Gull	7. 2.10	Ecclesbourne *S*	imm. ♀
224	Ivory Gull	11. 2.10	Ecclesbourne *S*	imm. ♂
225	Ivory Gull	15. 1.14	St. Leonards *S*	imm. ♀
226	[Slender-billed Gull	26. 1.14	St. Leonards *S*	imm. ♀
227	[Slender-billed Gull	24. 6.14	Bexhill *S*	♂
228	[Great Black-headed Gull	24. 3.11	St. Leonards *S*	ad.
229	[Great Black-headed Gull	2. 3.13	Cooden *S*	ad. ♂
230	*Great Black-headed Gull	25. 6.15	Jury's Gap *S*	ad. ♂
231	[Great Black-headed Gull	13. 7.17	Broomhill *S*	ad. ♂
232	*Mediterranean Black-headed Gull	8. 9.13	Littlestone *K*	♂
233	*Mediterranean Black-headed Gull	15. 7.15	Rye *S*	ad. ♂
234	*Mediterranean Black-headed Gull	16. 7.15	Rye *S*	ad. ♂
235	*Mediterranean Black-headed Gull	16. 7.15	Rye *S*	ad. ♀
236	*Mediterranean Black-headed Gull	21. 7.15	Rye *S*	ad. ♀
237	[Mediterranean Black-headed Gull	0.11.23	St. Leonards *S*	imm.
238	*Bonaparte's Gull	3.11.13	St. Leonards *S*	imm. ♂

	Sent to	*Examined by*	*Recorded by*	*Reference*
	Bristow			H, 1: 386
			Bradshaw, G. W.	Z, 1895: 449
			Alexander, B.	Z, 1896: 411
		Bristow		H, 1: 389
	Bristow		Edwards	Z, 1901: 390
			Butterfield	Z, 1901: 390
	Bristow		Nicoll	BBOC, 15: 12
			Nichols	BB, 3: 257
			Ticehurst, N. F.	BB, 4: 253
		Ford-Lindsay	Ford-Lindsay	BB, 7: 174
		Ford-Lindsay	Ford-Lindsay	BB, 7: 174
				HESN, 3: 168
				HESN, 3: 168
. Clarke, of Street, Hastings	Bristow	Butterfield		W-B, 3: 213]
utherden	Bristow	Ticehurst, N. F.	Ticehurst, N. F.	BBOC, 13: 77
		Nicoll		H, 1: 404
		Nicoll		H, 1: 404
	Bristow			W-B, 3: 118
				W-B, 3: 118
				HESN, 1: 18
				HESN, 3: 131
ss, a relative Southerden			Ticehurst, N. F.	BBOC, 13: 78
named Jones				H, 1: 404
named Ransom	Bristow	Butterfield	Butterfield	Z, 1903: 392
		Ford-Lindsay	Ford-Lindsay	BB, 7: 23
nan as on 30.4.13		Ford-Lindsay	Ford-Lindsay	BB, 7: 23
nan as on 30.4.13		Ford-Lindsay	Ford-Lindsay	BB, 7: 23
nan as on 30.4.13		Ford-Lindsay	Ford-Lindsay	BB, 7: 23
		Butterfield	Nichols	BB, 5: 50
		Butterfield	Nichols	BB, 5: 50
		Ford-Lindsay	Ford-Lindsay	BB, 6: 348
		Ford-Lindsay	Ford-Lindsay	BB, 6: 348
	Bristow			HESN, 3: 167]
		Butterfield	Nichols	BB, 5: 49
		Edwards	Nichols	BB, 5: 49
			Mullens, W. H.	HESN, 2: 174
				W-B, 3: 292]
				W-B, 3: 292]
				W-B, 3: 274]
	Bristow	Butterfield		HESN, 4: 37]
		Ford-Lindsay & Butterfield	Ford-Lindsay	BB, 9: 70
	Bristow	Butterfield		HESN, 4: 37]
		Ford-Lindsay	Nichols	BB, 8: 13
	Bristow	Parkin	Parkin	BB, 9: 69
	Bristow		Parkin	BB, 9: 69
	Bristow		Parkin	BB, 9: 69
	Bristow	Parkin	Parkin	BB, 9: 69
				W-B, 3: 273]
		Ford-Lindsay	Ford-Lindsay	BB, 8: 235

No.	*Bird*	*Date*	*Locality*	*Age/*
239	[Bonaparte's Gull	20. 4.14	St. Leonards *S*	ad.
240	[Bonaparte's Gull	26. 4.14	Pevensey *S*	ad.
241	Sabine's Gull	6.10.09	St. Leonards *S*	imm
242	Sabine's Gull	0. 3.12	St. Leonards *S*	imm
243	Sabine's Gull	6. 5.15	Jury's Gap *S*	♂
244	White-winged Black Tern	25. 5.04	Lydd *K*	♀
245	White-winged Black Tern	29. 5.04	Dungeness *K*	1
246	White-winged Black Tern	29. 5.04	Dungeness *K*	1
247	White-winged Black Tern	29. 5.04	Dungeness *K*	1
248	White-winged Black Tern	29. 5.04	Dungeness *K*	1
249	White-winged Black Tern	29. 5.04	Dungeness *K*	1
250	White-winged Black Tern	29. 5.11	Winchelsea/Rye *S*	♂
251	White-winged Black Tern	29. 5.11	Winchelsea/Rye *S*	♂
252	White-winged Black Tern	29. 5.11	Winchelsea/Rye *S*	♀
253	White-winged Black Tern	1. 6.11	nr Lydd *K*	1
254	White-winged Black Tern	1. 6.11	nr Lydd *K*	1
255	White-winged Black Tern	15. 5.22	Romney Marsh *K*	♂
256	*Whiskered Tern	9. 8.05	Rye Harbour *S*	ad.
257	*Whiskered Tern	9. 8.05	Rye *S*	1
258	*Whiskered Tern	9. 8.05	Pevensey *S*	1
259	*Whiskered Tern	9. 8.05	Pevensey *S*	1
260	*Whiskered Tern	9. 8.05	Pevensey *S*	1
261	*Whiskered Tern	10. 8.05	Pevensey *S*	1
262	[Whiskered Tern	0. 5.18	nr Lydd *K*	1
263	[Whiskered Tern	0. 5.18	nr Lydd *K*	1
264	Gull-billed Tern	18. 6.13	Winchelsea *S*	♂
265	Gull-billed Tern	21. 6.13	Winchelsea *S*	♀
266	Gull-billed Tern	23. 6.13	Winchelsea *S*	♂
267	*Caspian Tern	4. 6.13	Rye Bay *S*	ad.
268	*Caspian Tern	4. 8.15	Jury's Gap *S*	ad.
269	*Caspian Tern	4. 8.15	Jury's Gap *S*	ad.
270	*Caspian Tern	3. 6.16	Rye *S*	♂
271	*Sooty Tern	9. 4.14	Jury's Gap *S*	♂
272	*Sooty Tern	10. 4.14	Jury's Gap *S*	♀
273	[Royal Tern	17. 1.20	Pevensey Marsh *S*	♂
274	[Noddy Tern	21.10.14	Fairlight *S*	♀
275	[Noddy Tern	29.10.30	Bulverhythe *S*	1
276	[Great Spotted Cuckoo	23. 5.18	Crowhurst *S*	♂
277	Scops Owl	16. 4.18	Beekley *S*	♂
278	Scops Owl	16. 4.18	Beekley *S*	♀
279	*Tengmalm's Owl	2. 1.14	Sandhurst *K*	1
280	*Tengmalm's Owl	2. 1.14	Sandhurst *K*	1
281	Alpine Swift	10. 6.14	Winchelsea *S*	ad. ♀
282	Alpine Swift	14. 6.14	Winchelsea *S*	ad. ♂
283	Alpine Swift	2. 6.17	Winchelsea *S*	1
284	[Belted Kingfisher	17. 3.19	Crowhurst *S*	♂
285	[Belted Kingfisher	18. 3.19	Crowhurst *S*	♀
286	Bee-eater	6. 6.03	Burwash *S*	1

y"	*Sent to*	*Examined by*	*Recorded by*	*Reference*
				HESN, 4: 37]
				HESN, 4: 37]
				HESN, 1: 206
				W-B, 3: 263
l wounded)		Ford-Lindsay	Ford-Lindsay	BB, 9: 69
				H, 1: 452
	Bristow	Ticehurst, N. F.		H, 1: 452
	Bristow	Ticehurst, N. F.		H, 1: 452
	Bristow	Ticehurst, N. F.		H, 1: 452
	Bristow			H, 1: 452
	Bristow			H, 1: 452
		Ford-Lindsay	Ford-Lindsay	BB, 5: 54
		Ford-Lindsay	Ford-Lindsay	BB, 5: 54
		Ford-Lindsay	Ford-Lindsay	BB, 5: 54
				H, 1: 452
				H, 1: 452
				H, 1: 452
Olliver, a market ner at Hollington	Bristow			W-B, 3: 242
	Bristow			W-B, 3: 242
	Bristow			W-B, 3: 242
	Bristow			W-B, 3: 242
	Bristow			W-B, 3: 242
	Bristow			W-B, 3: 242
				H, 1: 453]
				H, 1: 453]
			Ford-Lindsay	BB, 7: 86
		Butterfield & Ford-Lindsay	Ford-Lindsay	BB, 7: 86
			Ford-Lindsay	BB, 7: 86
		Ford-Lindsay	Ford-Lindsay	BB, 7: 59
		Ford-Lindsay	Ford-Lindsay	BB, 9: 98
		Ford-Lindsay	Ford-Lindsay	BB, 9: 98
		Butterfield & Ford-Lindsay	Nichols	BB, 12: 118
		Nichols	Nichols	BB, 9: 98
		Butterfield & Ford-Lindsay	Nichols	BB, 9: 98
				W-B, 3: 260]
d dead or dying)				W-B, 3: 261]
				HESN, 4: 114]
				W-B, 2: 199]
				HESN, 3: 2
				HESN, 3: 2
		Ford-Lindsay	Ford-Lindsay	HESN, 2: 172
		Ford-Lindsay	Ford-Lindsay	HESN, 2: 172
		Ford-Lindsay	Ford-Lindsay	BB, 8: 50
		Ford-Lindsay	Ford-Lindsay	BB, 8: 50
	Bristow	Butterfield	Butterfield	HESN, 3: 77
				W-B, 2: 176]
				W-B, 2: 176]
				W-B, 2: 163

No.	*Bird*	*Date*	*Locality*	*Age/S*
287	Bee-eater	31. 5.05	Dallington *S*	ad. ♂
288	Bee-eater	5. 6.05	Burwash *S*	ad. ♂
289	Bee-eater	6. 6.05	nr Ashburnham *S*	1
290	Bee-eater	9. 9.05	Burwash *S*	1
291	Bee-eater	2.10.05	Brightling *S*	1
292	Bee-eater	12. 4.11	Winchelsea *S*	1
293	Roller	24. 9.97	Catsfield *S*	1
294	Roller	12.10.97	nr Catsfield *S*	1
295	Roller	9. 9.98	Catsfield *S*	1
296	Roller	21. 8.99	Catsfield *S*	1
297	Roller	2. 6.01	Ninfield *S*	1
298	Roller	3. 8.07	Ninfield *S*	1
299	Roller	12.10.15	Jury's Gap *S*	♀
300	[Three-toed Woodpecker	—	Sussex	1
301	*Black Lark	29. 1.07	Pevensey Levels *S*	ad. ♂
302	*Black Lark	31. 1.07	Lydd *K*	♀
303	*Black Lark	16. 2.07	Rye *S*	♂
304	*Black Lark	18. 2.07	Lydd *K*	♂
305	*Black Lark	30. 1.15	Westfield *S*	♀
306	*Black Lark	1. 2.15	Westfield *S*	♀
307	*Calandra Lark	16. 5.16	Filsham *S*	♂
308	*Calandra Lark	17. 5.16	Filsham *S*	♀
309	*White-winged Lark	27. 1.02	Woodchurch *K*	♂
310	*White-winged Lark	28. 1.02	Woodchurch *K*	♀
311	*White-winged Lark	22. 3.02	Woodchurch *K*	♂
312	*White-winged Lark	30.12.07	Pevensey Sluice *S*	♂
313	*White-winged Lark	1. 1.08	Pevensey Sluice *S*	♀
314	[White-winged Lark	10.11.15	Rye *S*	1
315	*White-winged Lark	30. 3.16	Winchelsea *S*	♂
316	*White-winged Lark	31. 3.16	Winchelsea *S*	♂
317	*White-winged Lark	31. 3.16	Winchelsea *S*	♀
318	*White-winged Lark	2. 4.16	Winchelsea *S*	♂
319	Short-toed Lark	22. 9.11	Winchelsea Marsh *S*	♂
320	Short-toed Lark	22. 9.11	Winchelsea Marsh *S*	♀
321	*Red-rumped Swallow	16. 5.09	Jury's Gap *S*	ad. ♀
322	Golden Oriole	22. 6.08	Heathfield *S*	♂
323	Golden Oriole	19. 6.10	Udimore *S*	♂
324	[Indian Golden Oriole	6. 5.06	Fairlight *S*	♂
325	*Thick-billed Nutcracker	14. 1.05	Benenden *K*	♂
326	Thick-billed Nutcracker	27. 4.05	Northiam *S*	♀
327	*Thick-billed Nutcracker	12. 2.07	Broadoak *S*	♂
328	*Thick-billed Nutcracker	7.11.08	Penhurst *S*	♂
329	[Thick-billed Nutcracker	3. 2.09	Hastings *S*	1
330	*Thick-billed Nutcracker	4. 3.09	Guestling *S*	♀
331	Slender-billed Nutcracker	2.12.11	Brede *S*	♀
332	Slender-billed Nutcracker	26.12.12	Wartling *S*	♂
333	Slender-billed Nutcracker	28.12.12	Wartling *S*	♀
334	Slender-billed Nutcracker	16. 2.14	Brede *S*	♀
335	Slender-billed Nutcracker	28. 2.23	Northiam *S*	♂
336	Slender-billed Nutcracker	23. 1.24	Bodiam *S*	♀
337	*Wallcreeper	26.12.05	nr Ecclesbourne *S*	♂
338	*Wallcreeper	1.11.12	Camber Castle *S*	♀

by"	*Sent to*	*Examined by*	*Recorded by*	*Reference*
			Ticehurst, N. F.	BB, 1: 282
n named Carley				W-B, 2: 163
				W-B, 2: 163
	Bristow		Bristow	W-B, 2: 163
	Bristow		Bristow	W-B, 2: 163
		Ford-Lindsay	Ford-Lindsay	BB, 4: 365
pper			Bradshaw, G. W.	Z, 1897: 469
				Z, 1898: 24
			Nichols	W-B, 2: 170
			Nichols	W-B, 2: 170
			Parkin	Z, 1901: 316
	Bristow			W-B, 2: 170
	Bristow		Butterfield	HESN, 3: 128
	Bristow			W-B, 2: 188]
ergeant	Bristow	Ticehurst, C. B.	Ticehurst, C. B.	BBOC, 19: 57
	Bristow	Ticehurst, C. B.	Ticehurst, C. B.	BBOC, 19: 57
	Bristow		Ticehurst, C. B.	BBOC, 19: 57
nn, a looker	Bristow	Butterfield	Ticehurst, C. B.	BBOC, 19: 57
			Parkin	BB, 9: 68
			Parkin	BB, 9: 68
		Butterfield	Nichols	BB, 10: 254
		Butterfield	Nichols	BB, 10: 254
n named Ward	Bristow		Ticehurst, N. F.	BBOC, 12: 50
n named Ward	Bristow		Ticehurst, N. F.	BBOC, 12: 50
	Bristow		Ticehurst, N. F.	BBOC, 13: 15
		Butterfield	Butterfield	BBOC, 21: 51
		Butterfield	Butterfield	BBOC, 21: 51
			(Haslemere Mus.)	per EMN]
		Butterfield	Nichols	BB, 12: 159
		Butterfield	Nichols	BB, 12: 159
		Butterfield	Nichols	BB, 12: 159
		Ford-Lindsay	Nichols	BB, 12: 159
		Butterfield		HESN, 4: 25
		Butterfield		HESN, 4: 25
	Bristow	Nicoll & Ticehurst, N. F.	Nicoll	BBOC, 23: 93
	Bristow			W-B, 1: 65
	Bristow		Ford-Lindsay	BB, 4: 119
pper				HESN, 3: 75]
nekeeper		Nicoll	Ticehurst, N. F.	T, p. 193
				W-B, 1: 38
			Nichols	BB, 1: 185
			Ticehurst, N. F.	BB, 5: 120
			(Haslemere Mus.)	per EMN]
		Edwards	Nichols	BB, 4: 23
		Ford-Lindsay	Ford-Lindsay	BB, 5: 225
		Ford-Lindsay	Ford-Lindsay	BB, 6: 278
		Ford-Lindsay	Ford-Lindsay	BB, 6: 278
			Mullens, W. H.	HESN, 2: 170
	Bristow			HESN, 4: 1
	Bristow			HESN, 4: 23
	Bristow	Butterfield	Butterfield	BBOC, 16: 44
	Bristow	Ford-Lindsay	Ford-Lindsay	BB, 6: 218

No.	*Bird*	*Date*	*Locality*	*Age/Sex*
339	*Wallereeper	28.12.15	nr Ecclesbourne *S*	♀
340	*Dusky Thrush	25. 1.15	Hollington *S*	♀
341	*Dusky Thrush	7. 2.15	Hollington *S*	♀
342	*Dusky Thrush	20. 2.15	Hollington *S*	♂
343	*Dusky Thrush	22. 2.15	Hollington *S*	♀
344	*Dusky Thrush	3. 3.15	Hollington *S*	♂
345	*Dusky Thrush	3. 3.15	Crowhurst *S*	♀
346	*Blaek-throated Thrush	30. 1.09	Newenden *K*	ad. ♂
347	*Blaek-throated Thrush	15. 3.11	Wittersham *K*	ad. ♂
348	*Alpine Ring Ouzel	23. 5.11	Guestling *S*	ad. ♂
349	*White's Thrush	9.11.14	Brede *S*	ad. ♂
350	*White's Thrush	27.12.15	Brede *S*	♂
351	*White's Thrush	26. 2.16	nr St. Leonards *S*	♂
352	*Roek Thrush	1. 9.11	Pett *S*	imm. ♂
353	*Roek Thrush	2. 9.11	Pett *S*	imm. ♀
354	[Western Desert Wheatear	30. 3.23	Pevensey *S*	♂
355	*Eastern Desert Wheatear	21. 5.13	Scotney *K*	♂
356	*Western Blaek-eared Wheatear	28. 5.02	nr Polegate *S*	♂
357	*Western Blaek-eared Wheatear	22. 5.05	nr Hooe *S*	♂
358	*Western Blaek-eared Wheatear	23. 5.06	nr Lydd *K*	ad. ♂
359	*Western Blaek-eared Wheatear	2. 5.07	Winchelsea *S*	♂
360	*Western Blaek-eared Wheatear	16. 5.12	nr Winehelsea *S*	ad. ♂
361	*Western Black-eared Wheatear	19. 5.12	nr Winehelsea *S*	♂
362	*Western Black-eared Wheatear	5. 5.15	Hollington *S*	♂
363	*Western Blaek-eared Wheatear	30.10.15	nr St. Leonards *S*	♂
364	[Western Blaek-eared Wheatear	2. 5.17	Pevensey *S*	♀
365	[Western Black-eared Wheatear	7. 5.17	Pevensey *S*	♂
366	*Eastern Blaek-eared Wheatear	9. 9.05	Pett *S*	ad. ♂
367	*Eastern Black-eared Wheatear	21. 4.14	nr Westfield *S*	♀
368	*Eastern Blaek-eared Wheatear	30. 4.14	Pevensey *S*	♂
369	[Eastern Blaek-eared Wheatear	15. 5.24	Camber Castle *S*	ad. ♂
370	*Isabelline Wheatear	17. 4.11	Rye Harbour *S*	♂
371	*Isabelline Wheatear	28. 3.12	Rye Harbour *S*	♂
372	*Isabelline Wheatear	10. 5.12	St. Leonards *S*	♂
373	*Isabelline Wheatear	10. 9.20	Pevensey *S*	1
374	*Blaek Wheatear	2. 9.09	nr Rye Harbour *S*	♂
375	*Blaek Wheatear	16. 9.09	nr Rye Harbour *S*	♀
376	*North Afriean Blaek Wheatear	7. 6.15	Pevensey Sluice *S*	♂
377	[Indian Stoneehat	22. 5.04	Fairfield *K*	1
378	[Siberian Stoneehat	24. 4.09	Jury's Gap *S*	ad. ♂
379	[Thrush Nightingale	22.10.04	Smeeth *K*	imm. ♂
380	*White-spotted Bluethroat	6.10.02	Dungeness *K*	♂
381	*White-spotted Bluethroat	1. 9.05	Hastings *S*	♂
382	*White-spotted Bluethroat	15. 5.11	Pett Level *S*	♂
383	*White-spotted Bluethroat	17. 5.11	Pett Level *S*	♂
384	*White-spotted Bluethroat	22. 9.12	St. Leonards *S*	imm. ♂

	Sent to	*Examined by*	*Recorded by*	*Reference*
		Ford-Lindsay	Nichols	BB, 12: 67
		Ford-Lindsay	Ford-Lindsay	BB, 8: 267
		Ford-Lindsay	Ford-Lindsay	BB, 8: 267
		Ford-Lindsay	Ford-Lindsay	BB, 8: 267
		Ford-Lindsay	Ford-Lindsay	BB, 8: 267
		Ford-Lindsay	Ford-Lindsay	BB, 8: 267
		Ford-Lindsay	Ford-Lindsay	BB, 8: 267
mamed Fuller	Bristow	Parkin	Parkin	BB, 2: 378
	Bristow	Ticehurst, N. F.	Ticehurst, N. F.	BB, 5: 50
		Nicoll	Nicoll	BB, 5: 72
	Bristow	Ford-Lindsay & Butterfield	Ford-Lindsay	BB, 8: 199
		Ford-Lindsay	Nichols	BB, 10: 293
		Butterfield	Nichols	BB, 10: 293
		Ford-Lindsay	Ford-Lindsay	BB, 5: 130
		Ford-Lindsay	Ford-Lindsay	BB, 5: 130
	Bristow		Butterfield	HESN, 4: 3]
		Ford-Lindsay	Ford-Lindsay	BB, 7: 117
nnamed Williams	Bristow	Butterfield	Butterfield	BBOC, 12: 78
		Butterfield	Butterfield	BBOC, 15: 72
	Bristow	Ticehurst, C. B.	Ticehurst, C. B.	BBOC, 16: 114
	Bristow	Butterfield	Nichols	BB, 1: 185
		Edwards	Nichols	BB, 6: 184
		Parkin	Nichols	BB, 6: 184
		Ford-Lindsay	Ford-Lindsay	BB, 9: 121
		Ford-Lindsay	Ford-Lindsay	BB, 9: 249
				HESN, 3: 77]
				HESN, 3: 77]
			Nicoll	BBOC, 16: 22
		Nichols	Nichols	BB, 9: 121
		Nicoll	Nichols	BB, 9: 122
		Butterfield		W-B, 2: 92]
	Bristow	Ticehurst, N. F.	Ticehurst, N. F.	BB, 5: 74
me man as on	Bristow	Ford-Lindsay	Ford-Lindsay	BB, 5: 328
		Butterfield	Parkin	BB, 6: 89
			Butterfield	HESN, 3: 161
thc gunning	Bristow	Edwards	Ticehurst, N. F.	BB, 3: 289
ty at Rye				
	Bristow	Ticehurst, N. F.	Ticehurst, N. F.	BB, 3: 289
	Bristow	Parkin & Butterfield	Parkin	BB, 9: 200
ate collector				HESN, 1: 207]
			Ticehurst, N. F.	HESN, 1: 207]
	Bristow	Nicoll	Nicoll	BBOC, 15: 20]
dead by a	Bristow	Nicoll	Nicoll	BBOC, 13: 14
an namcd				
)				
	Bristow		Ticehurst, C. B.	BBOC, 16: 34
leman staying		Ford-Lindsay	Ford-Lindsay	BB, 5: 23
chelsea				
			Nichols	BB, 5: 106
l dead by	Bristow		Ticehurst, N. F.	BB, 6: 187
ompton)				

No.	*Bird*	*Date*	*Locality*	*Age*
385	*Cetti's Warbler	12. 5.04	Battle *S*	♂
386	*Cetti's Warbler	1. 9.06	Whatlington *S*	♀
387	*Cetti's Warbler	21. 6.16	Westfield *S*	♂
388	*Savi's Warbler	30. 5.16	St. Leonards *S*	♂
389	*Moustached Warbler	12. 4.15	St. Leonards *S*	♂
390	*Great Reed Warbler	25. 9.03	St. Leonards *S*	ad.
391	*Great Reed Warbler	1. 5.05	Little Common *S*	1
392	*Great Reed Warbler	12. 9.06	St. Leonards *S*	ad.
393	*Eastern Great Reed Warbler	24. 8.16	St. Leonards *S*	♂
394	*Aquatic Warbler	8. 8.02	Winchelsea *S*	♂
395	*Aquatic Warbler	11. 8.02	Winchelsea *S*	♀
396	*Aquatic Warbler	18. 8.05	Broomhill *S*	ad.
397	*Aquatic Warbler	10. 9.14	Little Common *S*	imm.
398	*Aquatic Warbler	10. 9.14	Little Common *S*	imm.
399	*Melodious Warbler	30. 4.97	Burwash *S*	♂
400	*Melodious Warbler	10. 5.00	Ninfield *S*	♂
401	*Icterine Warbler	30. 4.97	Burwash *S*	♀
402	*Icterine Warbler	15. 5.02	Crockham Hill *K*	ad.
403	*Ieterine Warbler	26. 6.05	Peasmarsh *S*	1
404	*Ieterine Warbler	26. 8.14	Hollington *S*	imm.
405	*Olivaceous Warbler	20. 5.15	nr St. Leonards *S*	♂
406	[*Olivaceous Warbler	14. 6.20	Hollington *S*	♂
407	[*Olivaceous Warbler	19. 6.20	Hollington *S*	♂
408	*Barred Warbler	24. 4.07	Woodchurch *K*	ad.
409	*Barred Warbler	24. 4.07	Woodchurch *K*	ad.
410	*Orphean Warbler	7.10.03	nr St. Leonards *S*	♀
411	*Orphean Warbler	16. 9.05	nr St. Leonards *S*	imm.
412	*Orphean Warbler	21. 9.16	St. Leonards *S*	♂
413	*Rüppell's Warbler	5. 5.14	Baldslow *S*	♂
414	*Rüppell's Warbler	5. 5.14	Baldslow *S*	♂
415	*Sardinian Warbler	3. 6.07	nr Hastings *S*	♂
416	*Rufous Warbler	20. 9.13	Brede *S*	ad. ♂
417	*Brown-backed Warbler	15. 7.07	nr Hythe *K*	ad. ♂
418	[Brown-backed Warbler	4. 6.09	St. Helens *S*	♂
419	*Brown-backed Warbler	13. 5.10	Ninfield *S*	ad. ♂
420	*Brown-backed Warbler	7. 5.15	Westfield *S*	♂
421	*Brown-backed Warbler	8. 6.18	St. Leonards *S*	♂
422	*Yellow-browed Warbler	23.10.14	Hollington *S*	♀
423	*Dusky Warbler	18.10.16	St. Leonards *S*	1
424	*Brown Flycatcher	21. 5.09	nr Lydd *K*	ad. ♂
425	*Collared Flycatcher	12. 5.11	nr Winchelsea *S*	ad. ♂
426	*Collared Flycatcher	13. 5.11	nr Winchelsea *S*	♂
427	*Collared Flycatcher	15. 5.16	Hollington *S*	♂
428	*Collared Flycatcher	15. 5.16	Hollington *S*	♂
429	*Collared Flycatcher	5. 5.22	Westfield *S*	ad. ♂
430	*Red-breasted Flycatcher	3.10.16	Rye Harbour *S*	♀
431	[Alpine Accentor	26.12.22	Fairlight *S*	1
432	[Alpine Accentor	26.12.22	Fairlight *S*	1
433	[Alpine Accentor	26.12.22	Fairlight *S*	1

	Sent to	*Examined by*	*Recorded by*	*Reference*
ıaer-boy	Bristow	Nicoll	Nicoll	BBOC, 14: 84
	Bristow	Edwards	Nichols	BB, 1: 185
		Parkin	Webster, G. V.	BB, 10: 137
	Bristow	Butterfield	Nichols	BB, 10: 167
		Ford-Lindsay	Ford-Lindsay	BB, 9: 197
			Nicoll	BBOC, 14: 18
	Bristow		Nichols	Z, 1905: 268
	Bristow			W-B, 1: 381
dead by Mr.		Butterfield	Nichols	BB, 10: 254
ıaer's boy			Bonhote, J. L.	BBOC, 13: 13
ıaer's boy			Bonhote, J. L.	BBOC, 13: 13
			Nicoll	BBOC, 16: 22
		Ford-Lindsay	Ford-Lindsay	BB, 8: 267
		Ford-Lindsay	Ford-Lindsay	BB, 8: 267
	Bristow			W-B, 2: 24
	Bristow	Butterfield	Butterfield	I, 1900: 569
				BBOC, 6: 51
Southon, a	Bristow			DRC: 263
	Bristow		Nichols	Z, 1905: 349
		Ford-Lindsay	Ford-Lindsay	BB, 8: 146
	Bristow	Parkin	Parkin	BB, 9: 198
		Butterfield		HESN, 3: 160]
		Butterfield		HESN, 3: 160]
	Bristow	Ticehurst, N. F.	Ticehurst, N. F.	BBOC, 19: 89
	Bristow	Ticehurst, N. F.	Ticehurst, N. F.	BBOC, 19: 89
Kite	Bristow	Butterfield	Butterfield	BBOC, 14: 16
pphed)	Bristow	Ticehurst, N. F.	Ticehurst, C. B.	BBOC, 16: 35
	Bristow	Nichols & Butterfield	Nichols	BB, 11: 45
		Ford-Lindsay	Ford-Lindsay	BB, 8: 93
		Ford-Lindsay	Ford-Lindsay	BB, 8: 93
	Bristow	Parkin	Parkin	BB, 1: 86
		Ford-Lindsay	Ford-Lindsay	BB, 7: 172
itehead	Bristow	Ticehurst, N. F.	Nichols	BB, 1: 257
	Bristow		Bristow	W-B, 2: 56]
rris	Bristow	Edwards	Witherby, H. F.	BB, 4: 310
		Ford-Lindsay	Ford-Lindsay	BB, 9: 155
		Butterfield	Nichols	BB, 12: 160
		Ford-Lindsay	Ford-Lindsay	BB, 8: 199
	Bristow	Butterfield	Nichols	BB, 11: 45
	Bristow	Bonhote, J. L. & Ticehurst, N. F.	Nicoll	BB, 3: 112
			Nichols	BB, 5: 238
			Nichols	BB, 5: 11
	Bristow	Butterfield	Nichols	BB, 10: 166
	Bristow	Butterfield	Nichols	BB, 10: 166
dener			Mullens, W. H.	HESN, 3: 260
lers		Ford-Lindsay	Nichols	BB, 11: 45
	Bristow	Butterfield		HESN, 3: 260]
	Bristow	Butterfield		HESN, 3: 260]
	Bristow	Butterfield		HESN, 3: 260]

No.	*Bird*	*Date*	*Locality*	*Age*
434	[Alpine Accentor	23. 4.23	Pett *S*	♂
435	Tawny Pipit	22. 9.03	Rye Harbour *S*	imm
436	Tawny Pipit	22. 9.03	Rye Harbour *S*	imm
437	Tawny Pipit	24. 9.03	Rye Harbour *S*	imm
438	Tawny Pipit	24. 9.03	Rye Harbour *S*	imm
439	Tawny Pipit	14. 8.04	Rye *S*	ad
440	Tawny Pipit	17. 8.04	Rye *S*	ad
441	Tawny Pipit	26. 9.04	Cooden *S*	imm
442	*Tawny Pipit	23. 5.05	S.E. Sussex	pair
				egg
443	Tawny Pipit	30. 4.14	Little Common *S*	♂
444	Tawny Pipit	2. 5.18	Pevensey *S*	1
445	Tawny Pipit	21. 4.22	Pevensey *S*	1
446	*Red-throated Pipit	13.11.95	nr St. Leonards *S*	ad.
447	*Red-throated Pipit	26.11.01	Ninfield *S*	imm
448	[Red-throated Pipit	7. 5.04	Rye *S*	ad.
449	*Red-throated Pipit	29. 4.09	nr Wittersham *K*	ad.
450	*Red-throated Pipit	22. 5.13	Hooe *S*	ad.
451	*Red-throated Pipit	22. 5.13	Hooe *S*	ad.
452	[Red-throated Pipit	17. 5.22	Little Common *S*	♂
453	*Masked Wagtail	26. 4.19	St. Leonards *S*	ad.
454	*Grey-headed Wagtail	13. 5.03	Willingdon *S*	ad.
455	*Grey-headed Wagtail	13. 5.03	Willingdon *S*	ad.
456	*Grey-headed Wagtail	2. 5.04	Winchelsea *S*	ad.
457	*Grey-headed Wagtail	20. 6.06	Romney Marsh *K*	pair
				egg
458	*Grey-headed Wagtail	29. 5.07	Winchelsea *S*	ad.
459	*Grey-headed Wagtail	31. 5.09	nr Rye *S*	ad.
460	*Grey-headed Wagtail	12. 4.11	Winchelsea *S*	ad.
461	[Grey-headed Wagtail	0. 0.12	Winchelsea *S*	♂
462	[Grey-headed Wagtail	0. 0.12	Winchelsea *S*	♂
463	*Grey-headed Wagtail	28. 4.12	Seotney *K*	ad.
464	*Grey-headed Wagtail	10. 5.17	Peyensey *S*	ad.
465	*Blaek-headed Wagtail	13. 5.03	Willingdon *S*	ad.
466	*Blaek-headed Wagtail	3. 6.08	nr Lydd *K*	ad.
467	*Blaek-headed Wagtail	23. 5.09	Winchelsea *S*	ad.
468	*Blaek-headed Wagtail	26. 5.09	Romney Marsh *S*	ad.
469	*South European Grey Shrike	2. 1.11	Pett *S*	♂
470	*Lesser Grey Shrike	7.10.07	Brookland *K*	imm.
471	*Lesser Grey Shrike	21. 4.09	Lunsfords Cross *S*	♂
472	*Lesser Grey Shrike	21. 4.09	Lunsfords Cross *S*	♀
473	*Lesser Grey Shrike	5. 5.12	Hollington *S*	♂
474	*Lesser Grey Shrike	7. 5.12	Hollington *S*	♀
475	*Lesser Grey Shrike	6. 5.14	Crowhurst *S*	ad.
476	Woodehat Shrike	0. 5.92	Fairlight *S*	1
477	Woodchat Shrike	29. 7.92	Fairlight *S*	ad.
478	Woodchat Shrike	1. 5.98	St. Leonards *S*	1
479	Woodehat Shrike	29. 6.01	Rye *S*	1
480	Woodehat Shrike	28. 6.04	Hollington *S*	ad.
481	Woodehat Shrike	15. 9.07	Camber *S*	1

Sent to	*Examined by*	*Recorded by*	*Reference*
			HESN, 4: 3]
			Z, 1904: 452
			Z, 1904: 452
			DRC: 223
			DRC: 223
Bristow			Z, 1904: 453
Bristow			Z, 1904: 453
			HESN, '09: 183
Bristow			W-B, 1: 215
		Mullens, W. H.	HESN, 2: 170
Bristow	Butterfield		HESN, 3: 2
Bristow	Butterfield	Butterfield	HESN, 3: 259
Bristow		Coburn, F.	Z, 1896: 101
		Saunders, H.	BBOC, 12: 35
Gasson & Bristow			W-B, 1: 230]
Bristow	Nichols, Edwards & Ticehurst, N. F.	Nichols	BB, 3: 256
	Ford-Lindsay	Ford-Lindsay	BB, 7: 52
	Ford-Lindsay	Ford-Lindsay	BB, 7: 52
Bristow		Bristow	HESN, 3: 259]
Bristow	Nicoll & Butterfield	Nicoll	BBOC, 39: 89
	Butterfield	Butterfield	BBOC, 13: 69
		Butterfield	BBOC, 13: 69
Bristow		Nicoll	BBOC, 14: 84
Bristow		Bunyard, P. F.	BBOC, 19: 23
Bristow	Nichols	Nichols	BB, 1: 185
Bristow	Ticehurst, C. B.	Ticehurst, C. B.	BB, 3: 257
			HESN, 2: 42
			HESN, 5: 125]
			HESN, 5: 125]
	Butterfield	Nichols	BB, 6: 184
	Butterfield		HESN, 3: 76
	Butterfield	Butterfield	BBOC, 13: 69
Bristow		Nichols	BB, 2: 165
	Butterfield	Nichols	BB, 3: 256
Bristow	Ticehurst, C. B.	Ticehurst, C. B.	BB, 3: 257
	Butterfield	Nichols	BB, 5: 75
Bristow	Ticehurst, N. F.		H, 2: 229
	Nichols	Nichols	BB, 3: 257
	Nichols	Nichols	BB, 3: 257
	Mullens, W. H.	Nichols	BB, 6: 184
	Butterfield	Nichols	BB, 6: 184
		Mullens, W. H.	HESN, 2: 171
		Parkin	Z, 1892: 229
Bristow			W-B, 1: 323
		Bradshaw, G. W.	Z, 1898: 267
Bristow		Bristow	W-B, 1: 324
		Ticehurst, N. F.	W-B, 1: 324
		Clark, J. A.	Z, 1908: 269

No.	*Bird*	*Date*	*Locality*	*Age*
482	Woodchat Shrike	24. 7.11	Winchelsea *S*	ad.
483	Woodchat Shrike	0. 6.18	Fairfield *K*	♂
484	Woodchat Shrike	3. 6.20	Pett *S*	1
485	Woodchat Shrike	30. 5.25	Pett *S*	♂
486	Woodchat Shrike	—	Newchurch *K*	1
487	*Corsican Woodchat Shrike	29. 6.09	Romney Marsh *K*	♂
488	*Masked Shrike	11. 7.05	Woodchurch *K*	ad.
489	Rose-coloured Starling	4. 6.00	nr Appledore *K*	ad.
490	Rose-coloured Starling	14. 5.01	Kent	ad.
491	Rose-coloured Starling	10. 6.02	Appledore *K*	♂
492	Rose-coloured Starling	22. 6.12	Pevensey *S*	ad.
493	Rose-coloured Starling	8. 8.14	Pevensey *S*	ad.
494	Rose-coloured Starling	16. 5.16	Winchelsea *S*	♂
495	Rose-coloured Starling	10. 7.17	Pevensey Levels *S*	1
496	[Rose-coloured Starling	19. 6.25	Romney Marsh *K*	♂
497	*Serin	17.12.01	nr St. Leonards *S*	1
498	[Long-tailed Rose Finch	11. 2.19	Little Common *S*	♂
499	[Long-tailed Rose Finch	11. 2.19	Little Common *S*	♀
500	[Long-tailed Rose Finch	11. 2.19	Little Common *S*	1
501	*Pine Grosbeak	25.10.05	Hawkhurst *K*	imm.
502	*Pine Grosbeak	25.10.05	Hawkhurst *K*	♀
503	*Pine Grosbeak	30.10.05	Netherfield *S*	♂
504	*Pine Grosbeak	30.10.05	Netherfield *S*	♂
505	*Pine Grosbeak	30.10.05	Netherfield *S*	♀
506	*Pine Grosbeak	4. 3.09	Biddenden *K*	♂
507	*Pine Grosbeak	4. 3.09	Biddenden *K*	♀
508	*Pine Grosbeak	20. 1.14	Brightling *S*	ad. ♂
509	*Pine Grosbeak	20. 1.14	Brightling *S*	ad. ♂
510	*Pine Grosbeak	25. 1.14	Brightling *S*	ad. ♀
511	[Pine Grosbeak	2. 2.17	Netherfield *S*	ad. ♂
512	Two-barred Crossbill	23. 2.99	Westfield *S*	ad. ♂
513	Two-barred Crossbill	26.12.02	Woodchurch *K*	♀
514	Two-barred Crossbill	10. 3.08	Penhurst *S*	♂
515	Two-barred Crossbill	10. 3.08	Penhurst *S*	♀
516	Two-barred Crossbill	15. 1.14	Netherfield *S*	♂
517	Two-barred Crossbill	15. 1.14	Netherfield *S*	♀
518	Two-barred Crossbill	20. 1.14	Netherfield *S*	♀
519	*Black-headed Bunting	3.11.94	nr Bexhill *S*	ad. ♀
520	*Black-headed Bunting	21. 4.05	Little Common *S*	ad. ♂
521	*Black-headed Bunting	5. 5.09	nr Westfield *S*	ad. ♂
522	*Black-headed Bunting	0. 4.12	Battle *S*	ad. ♂
523	[Rock Bunting	26. 2.06	Ninfield *S*	1
524	[Rock Bunting	26. 2.06	Ninfield *S*	1
525	*Rock Bunting	1. 4.10	Ninfield *S*	♂
526	*Rock Bunting	1. 4.10	Ninfield *S*	♂
527	*Rock Bunting	6. 4.15	Westfield *S*	♀

Sent to	*Examined by*	*Recorded by*	*Reference*
	Ford-Lindsay	Ford-Lindsay	BB, 5: 111
			H, 2: 230
		Butterfield	HESN, 3: 159
Bristow		Bristow	HESN, 4: 26
			H, 2: 230
Bristow	Ticehurst, C. B.	Ticehurst, C. B.	BBOC, 25: 76
Bristow	Nicoll	Nicoll	BBOC, 16: 22
			H, 2: 239
	Edwards & Ticehurst, N. F.	Edwards	Z, 1901
		Nicoll	H, 2: 239
	Ford-Lindsay	Ford-Lindsay	BB, 6: 152
	Ford-Lindsay	Ford-Lindsay	BB, 8: 114
		Butterfield	HESN, 2: 246
			HESN, 3: 75
Bristow			HESN, 4: 23]
			W-B, 1: 97
Bristow	Butterfield	Nicoll	BBOC, 39: 89]
Bristow	Butterfield	Nicoll	BBOC, 39: 89]
Bristow	Butterfield	Nicoll	BBOC, 39: 89]
Bristow	Ticehurst, C. B. & N. F.	Ticehurst, N. F.	BB, 1: 247
Bristow	Ticehurst, C. B. & N. F.	Ticehurst, N. F.	BB, 1: 247
		Ticehurst, N. F.	BB, 1: 247
		Ticehurst, N. F.	BB, 1: 247
		Ticehurst, N. F.	BB 1: 247
Bristow			H, 2: 256
Bristow			H, 2: 256
	Ford-Lindsay	Ford-Lindsay	BB, 7: 292
	Ford-Lindsay	Ford-Lindsay	BB, 7: 292
		Mullens, W. H.	HESN, 2: 170
			HESN, 3: 75]
		Ticehurst, N. F.	BBOC, 8: 59
Bristow	Ticehurst, N. F.	Ticehurst, N. F.	BBOC, 13: 51
Bristow	Butterfield	Nichols	BB, 2: 165
Bristow	Butterfield	Nichols	BB, 2: 165
	Ford-Lindsay	Ford-Lindsay	BB, 7: 292
	Ford-Lindsay	Ford-Lindsay	BB, 7: 292
		Mullens, W. H.	HESN, 2: 170
		Butterfield	Z, 1897: 273
Bristow			Z, 1905: 267
	Butterfield	Nichols	BB, 3: 412
Bristow		Griffith, A. F.	BBOC, 33: 134
Bristow	Butterfield		W-B, 1: 162]
Bristow	Butterfield		W-B, 1: 162]
Bristow	Butterfield	Nichols	BB, 5: 50
Bristow	Knight, G.	Nichols	BB, 5: 50
	Ford-Lindsay	Nichols	BB, 12: 89

No.	*Bird*	*Date*	*Locality*	*Age*
528	*Rustic Bunting	22. 9.02	Westfield *S*	imm
529	[Rustic Bunting	27. 9.03	Westfield *S*	1
530	[Rustic Bunting	0.11.03	nr St. Leonards *S*	1
531	[Rustic Bunting	29. 9.05	Ninfield *S*	1
532	[Rustic Bunting	30. 3.10	Little Common *S*	1
533	*Rustic Bunting	4.12.14	Westfield *S*	♂
534	*Western Large-billed Reed Bunting	26. 5.08	nr Lydd *K*	♂
535	*Western Large-billed Reed Bunting	6. 1.15	Filsham *S*	♂
536	*Eastern Large-billed Reed Bunting	23. 4.12	Rye *S*	♂
537	*Snow Finch	22. 2.05	Rye Harbour *S*	ad.
538	*Snow Finch	28.12.06	Paddock Wood *K*	1
539	*Snow Finch	28.12.06	Paddock Wood *K*	1
540	*Snow Finch	28. 2.16	Rye Harbour *S*	♂
541	*Snow Finch	28. 2.16	Rye Harbour *S*	♀
542	*Snow Finch	28. 2.16	Rye Harbour *S*	♀

Appendix B—Unacceptable records of birds "see

These are records which are very closely linked in various ways with the specimens in Appendix A and consequently have to be deleted. Wherever

No.	*Bird*	*Date*	*Locality*
543	Squacco Heron	0.10.13	Pett *S*
544	*Red-crested Pochard	Jan.Feb.11	Boreham Bridge *S*
545	*Ferruginous Duck	2. 1.12	Crowhurst *S*
546	*Sociable Plover	3. 5.07	Romney Marsh *K*
547	*Sociable Plover	0. 5.10	nr Winchelsea *S*
548	Sociable Plover	30. 4.14	nr Winchelsea *S*
549	*Killdeer	12-16.11.15	nr Winchelsea *S*
550	*Asiatic Golden Plover	23. 4.14	Wartling Marsh *S*
551	[Upland Sandpiper	22. 7.08	Pevensey Levels *S*
552	*Slender-billed Curlew	0. 9.10	nr Brookland *K*
553	Pectoral Sandpiper	1. 8.06	nr Rye Harbour *S*
554	*Broad-billed Sandpiper	27. 8.20	Rye Harbour *S*
555	Black-winged Stilt	7. 8.03	nr St. Leonards *S*
556	Black-winged Stilt	3.10.10	nr St. Leonards *S*
557	[Great Black-headed Gull	0. 7.11	Rye Bay *S*
558	*Mediterranean Black-headed Gull	0. 7.15	Rye *S*
559	*Mediterranean Black-headed Gull	11.11.15	Hastings *S*
560	[Bonaparte's Gull	0. 4.14	E. Sussex
561	White-winged Black Tern	29. 5.04	Dungeness *K*
562	White-winged Black Tern	29. 5.11	Winchelsea/Rye *S*
563	Alpine Swift	3. 8.08	Ebony *K*
564	Alpine Swift	9.10.23	St. Leonards *S*
565	Alpine Swift	0. 6.25	Wittersham *K*

	Sent to	*Examined by*	*Recorded by*	*Reference*
mmed	Bristow	Nicoll &	Ticehurst, N. F.	BBOC, 13: 15
Miller		Ticehurst, C. B.		
			Nichols	W-B, 1: 163]
		Nicoll		W-B, 1: 163]
			Nichols	W-B, 1: 164]
	Bristow		Bristow	W-B, 1: 164]
			Nichols	BB, 9: 92
	Bristow		Nicoll	BB, 2: 88
		Ford-Lindsay & Butterfield	Ford-Lindsay	BB, 9: 120
			Nichols	BB, 6: 153
	Bristow	Nicoll	Nicoll	BBOC, 15: 58
ayford	Bristow	Ticehurst, N. F.	Ticehurst, N. F.	BB, 1: 189
stings				
ayford	Bristow			H, 2: 290
stings				
		Butterfield	Nichols	BB, 12: 66
		Butterfield	Nichols	BB, 12: 66
		Butterfield	Nichols	BB, 12: 66

Hastings Area between 1892 and 1930

e: is a direct connection with one or more specimens in Appendix A, cross-ences are given. The explanation on pages 348-349 also applies here.

x	*"Seen by"*	*Recorded by*	*Reference*
(cf. 35)			W-B, 2: 342
s (cf. 53-57)		Ford-Lindsay	BB,4: 316
s (cf. 58-59)		Ford-Lindsay	BB, 5: 247
s (cf. 106)		Ticehurst, C.B.	BBOC, 19: 85
(cf. 107-110)			W-B, 3: 145
(cf. 111-113)	Nicoll	Witherby, H. F.	BB, 9: 157
(cf. 121-122)		Ford-Lindsay	BB, 9: 212
s (cf. 128-130)		Parkin	BB, 8: 52
	Bristow		W-B, 3: 151]
s (cf. 142-144)		Nicoll	BB, 5: 124
	Nicoll		W-B, 3: 171
	Nicoll		W-B, 3: 179
	Nicoll		W-B, 3: 214
(cf. 198)	Nicoll	Ticehurst, N. F.	BB, 4: 252
		Ford-Lindsay	BB, 9: 70]
s (cf. 233-236)		Parkin	BB, 9: 69
	Parkin	Parkin	BB, 9: 214
s (cf. 239-240)			HESN, 4: 37]
s (cf. 245-249)			H, 1: 452
s (cf. 250-252)		Ford-Lindsay	BB, 5: 54
	Bristow		HESN, 1: 207
	Butterfield	Butterfield	HESN, 4: 3
	Nicoll	Nicoll	BB, 19: 179

No.	*Bird*	*Date*	*Locality*
566	*Black Lark	29. 1.07	Pevensey Levels *S*
567	*Black Lark	31. 1.07	Lydd *K*
568	*Black Lark	0. 1.15	Hollington *S*
569	*Calandra Lark	17. 5.16	Filsham *S*
570	*White-winged Lark	3.11.15	nr Rye *S*
571	Slender-billed Nutcracker	0.12.12	Northiam *S*
572	*Dusky Thrush	Feb.Mar.15	Hollington *S*
573	[Isabelline Wheatear	0. 8.05	nr Rye *S*
574	*Aquatic Warbler	0. 8.06	Broomhill *S*
575	[Aquatic Warbler	summer.09	S.E. Sussex
576	Icterine Warbler	8. 5.00	Brightling *S*
577	Icterine Warbler	14. 5.01	Hollington *S*
578	Icterine Warbler	2. 9.02	St. Leonards *S*
579	Barred Warbler	31.10.02	St. Leonards *S*
580	Collared Flycatcher	5. 5.22	Westfield *S*
581	Richard's Pipit	7. 9.01	Pevensey Sluice *S*
582	Tawny Pipit	0. 5.06	S.E. Sussex
583	[Black-headed Wagtail	0. 5.02	Pevensey *S*
584	*Lesser Grey Shrike	6.11.01	nr St. Leonards *S*
585	Woodchat Shrike	29. 4.98	St. Leonards *S*
586	Woodchat Shrike	0. 6.02	Rye *S*
587	Rose-coloured Starling	23. 3.02	nr St. Leonards *S*
588	Rose-coloured Starling	8-14. 8.14	Pevensey *S*
589	Rose-coloured Starling	0. 8.14	Pett Level *S*
590	*Pine Grosbeak	25.10.05	Hawkhurst *K*
591	*Pine Grosbeak	30.10.05	Netherfield *S*
592	Two-barred Crossbill	15. 1.14	Netherfield *S*
593	Two-barred Crossbill	8. 2.17	Westfield *S*
594	[Black-headed Bunting	25.12.00	nr Pevensey *S*
595	Snow Finch	21. 2.05	Rye Harbour *S*

Appendix C—Chronological list of the Hastings Rarities

The numbers provide cross-references to Appendices A and B. Sight records are marked † and all occurrences not accepted in *The Handbook* are shown in square brackets. Nos. 83, 88, 300 and 486 are omitted from this list through total lack of dates

	May	Woodchat Shrike 476	
	3 Nov	Black-headed Bunting 519	
	30 Jun	Little Crake 89	
	Aug	Red-footed Falcon 72	
	2 Oct	Broad-billed Sandpiper 191	
	8 May	Lesser Kestrel 84	
	2 Sep	Broad-billed Sandpiper 192	
1892			
	29 Jul	Woodchat Shrike 477	
1894			
1895			
	13 Nov	Red-throated Pipit 446	
	5 Dec	Madeiran Petrel 3	
1896			
	6 Sep	Broad-billed Sandpiper 193	
	—	Red-footed Falcon 73	

../Sex	*"Seen by"*	*Recorded by*	*Reference*
..thers (♂, 2 ♀) (cf. 301)	Mr. Sargeant	Ticehurst, C. B.	BBOC, 19: 57
..thers (♂, 2 ♀) (cf. 302)		Ticehurst, C. B.	BBOC, 19: 57
(cf. 305-306)		Parkin	BB, 9: 68
..thers (cf. 307-308)		Nichols	BB, 10: 254
(cf. 314)	Kleinwort, M. L.	Kleinwort, M. L.	BB, 9: 209
(cf. 332-333)		Ford-Lindsay	BB, 6: 278
..thers (cf. 340-345)		Ford-Lindsay	BB, 8: 267
	Nicoll		W-B, 2: 93]
	Nicoll		W-B, 2: 20
..r, nest & young	Ford-Lindsay		W-B, 2: 21]
	Nicoll		W-B, 2: 22
	Nicoll		W-B, 2: 22
	Nicoll		W-B, 2: 22
	Nicoll		W-B, 2: 25
..ther (cf. 429)	The gardener	Mullens	HESN, 3: 260
	Nicoll		HESN, 1: 184
..r (cf. 442)	Bristow		W-B, 1: 216
♂	Nicoll		W-B, 1: 253]
	Nicoll		W-B, 1: 319
(cf. 478)	Nicoll		W-B, 1: 324
	Nicoll		W-B, 1: 324
	Nicoll		W-B, 1: 60
(cf. 493)		Ford-Lindsay	BB, 8: 114
		Ford-Lindsay	BB, 8: 114
..thers (cf. 501-502)		Ticehurst, N. F.	BB, 1: 247
..thers (cf. 503-505)		Ticehurst, N. F.	BB, 1: 247
..thers (cf. 516-517)		Ford-Lindsay	BB, 1: 247
		Mullens, W. H.	HESN, 3: 76
	Nicoll		W-B, 1: 143]
♂♂ (cf. 537)	Nicoll	Nicoll	BBOC, 15: 58

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30 Apr Melodious Warbler 379
30 Apr Icterine Warbler 401
11 May Night Heron 38

29 Apr †Woodchat Shrike 585
1 May Woodchat Shrike 478
8 Jun Little Bittern 45

23 Feb Two-barred Crossbill 512
15 Apr Red-footed Falcon 74
Spring Little Ringed Plover 115

2 Jan Eastern Little Bustard 96
8 May †Icterine Warbler 576
10 May Melodious Warbler 400
4 Jun Night Heron 39
4 Jun Rose-coloured Starling 489

1897
24 Sep Roller 293
12 Oct Roller 294

1898
2 Aug Pectoral Sandpiper 183
9 Sep Roller 295

1899
21 Aug Roller 296
15 Nov Great Snipe 137

1900
11 Oct Baird's Sandpiper 177
25 Dec †Black-headed Bunting 594
28 Dec Little Shearwater 7
28 Dec Eastern Little Bustard 97

1901

21 Jan North Atlantic Shearwater 21
14 May †Icterine Warbler 577
14 May Rose-coloured Starling 490
19 May Little Bittern 46
2 Jun Roller 297
3 Jun Red-footed Falcon 75
29 Jun Woodchat Shrike 479
4 Aug White-rumped Sandpiper 180
31 Aug Broad-billed Sandpiper 194
7 Sep †Richard's Pipit 581
14 Sep Broad-billed Sandpiper 195
16 Oct Squacco Heron 28
25 Oct Squacco Heron 29
6 Nov †Lesser Grey Shrike 584
26 Nov Red-throated Pipit 447
17 Dec Serin 497
— Red-footed Falcon 76

1902

27 Jan White-winged Lark 309
28 Jan White-winged Lark 310
8 Feb Eastern Little Bustard 98
22 Mar White-winged Lark 311
23 Mar †Rose-coloured Starling 587
15 May Icterine Warbler 402
28 May Western Black-eared Wheatear 356
May †Black-headed Wagtail 583
10 Jun Rose-coloured Starling 491
Jun †Woodchat Shrike 586
8 Aug Aquatic Warbler 394
11 Aug Aquatic Warbler 395
2 Sep †Icterine Warbler 578
22 Sep Rustic Bunting 528
6 Oct White-spotted Bluethroat 380
31 Oct †Barred Warbler 579
26 Dec Two-barred Crossbill 513

1903

Mar Ruddy Shelduck 63
13 May Grey-headed Wagtail 454
13 May Grey-headed Wagtail 455
13 May Black-headed Wagtail 465
30 May Pratincole 204
30 May Black-winged Pratincole 211
6 Jun Bee-eater 286
17 Jun Black-winged Pratincole 212
19 Jun Squacco Heron 30
22 Jun Squacco Heron 31
18 Jul Black-winged Pratincole 213
7 Aug †Black-winged Stilt 555
29 Aug Great Snipe 138
12 Sep Red-footed Falcon 77
12 Sep Red-footed Falcon 78
22 Sep Tawny Pipit 435
22 Sep Tawny Pipit 436
24 Sep Tawny Pipit 437
24 Sep Tawny Pipit 438
25 Sep Great Reed Warbler 390
27 Sep Rustic Bunting 529
7 Oct Orphean Warbler 410
Nov Rustic Bunting 530
— Red-footed Falcon 79

1904

4 Feb Bulwer's Petrel 24
2 May Grey-headed Wagtail 456
5 May Spotted Sandpiper 152
5 May Spotted Sandpiper 153
7 May Little Crake 90
7 May Red-throated Pipit 448
12 May Cetti's Warbler 385
22 May Indian Stonechat 377
25 May White-winged Black Tern 244
29 May White-winged Black Tern 245
29 May White-winged Black Tern 246
29 May White-winged Black Tern 247
29 May White-winged Black Tern 248
29 May White-winged Black Tern 249
29 May †White-winged Black Tern 561
May Little Bittern 47
28 Jun Woodchat Shrike 480
Jun Little Crake 91
19 Jul Pratincole 205
19 Jul Pratincole 206
7 Aug Solitary Sandpiper 148
14 Aug Tawny Pipit 439
17 Aug Tawny Pipit 440
29 Aug Broad-billed Sandpiper 196
19 Sep Pratincole 207
24 Sep Night Heron 40
26 Sep Tawny Pipit 441
28 Sep Night Heron 41
12 Oct Thrush Nightingale 379
19 Nov Goshawk 68

1905

Jan	Thick-billed Nutcracker 325	Aug	†Isabelline Wheatear 573
Feb	†Snow Finch 595	1 Sep	White-spotted Bluethroat 381
Feb	Snow Finch 537	9 Sep	Bee-eater 290
Apr	Black-headed Bunting 520	9 Sep	Eastern Black-eared Wheatear 366
Apr	Thick-billed Nutcracker 326	16 Sep	Orphean Warbler 411
May	Great Reed Warbler 391	29 Sep	Rustic Bunting 531
May	Western Black-eared Wheatear 357	2 Oct	Bee-eater 291
May	Tawny Pipit 442	25 Oct	Pine Grosbeak 501
May	Bee-eater 287	25 Oct	Pine Grosbeak 502
Jun	Squacco Heron 32	25 Oct	†Pine Grosbeak 590
Jun	Pratincole 208	30 Oct	Goshawk 69
Jun	Bee-eater 288	30 Oct	Goshawk 70
Jun	Bee-eater 289	30 Oct	Pine Grosbeak 503
Jun	Icterine Warbler 403	30 Oct	Pine Grosbeak 504
Jul	Masked Shrike 488	30 Oct	Pine Grosbeak 505
Aug	Whiskered Tern 256	30 Oct	†Pine Grosbeak 591
Aug	Whiskered Tern 257	14 Nov	Ruddy Shelduck 64
Aug	Whiskered Tern 258	26 Nov	Madeiran Petrel 4
Aug	Whiskered Tern 259	27 Nov	Madeiran Little Shearwater 8
Aug	Whiskered Tern 260	Nov	Ruddy Shelduck 65
Aug	Whiskered Tern 261	26 Dec	Eastern Little Bustard 99
Aug	Aquatic Warbler 396	26 Dec	Wallcreeper 337

1906

Feb	Mediterranean Shearwater 19	Aug	†Aquatic Warbler 574
Feb	Rock Bunting 523	1 Sep	Cetti's Warbler 386
Feb	Rock Bunting 524	12 Sep	Great Reed Warbler 392
Apr	Pratincole 209	19 Sep	Pectoral Sandpiper 184
May	Indian Golden Oriole 324	3 Oct	Night Heron 42
May	Western Black-eared Wheatear 358	5 Oct	Great Snipe 139
May	†Tawny Pipit 582	8 Nov	Madeiran Petrel 5
Jun	White-rumped Sandpiper 181	24 Nov	Baillon's Crake 86
Jun	Grey-headed Wagtail 457	28 Dec	Snow Finch 538
Aug	†Pectoral Sandpiper 553	28 Dec	Snow Finch 539

1907

Jan	Black Lark 301	29 May	Squacco Heron 33
Jan	†Black Lark 566	29 May	Squacco Heron 34
Jan	Black Lark 302	29 May	Grey-headed Wagtail 458
Jan	†Black Lark 567	3 Jun	Sardinian Warbler 415
Feb	Thick-billed Nutcracker 327	Jun	Baillon's Crake 87
Feb	Black Lark 303	15 Jul	Brown-backed Warbler 417
Feb	Black Lark 304	3 Aug	Roller 298
Apr	Barred Warbler 408	15 Aug	Dowitcher 135
Apr	Barred Warbler 409	15 Sep	Woodchat Shrike 481
May	Western Black-eared Wheatear 359	17 Sep	Semipalmated Sandpiper 190
May	Sociable Plover 106	7 Oct	Lesser Grey Shrike 470
May	†Sociable Plover 546	19 Oct	Great Shearwater 16
May	Egyptian Black Kite 71	30 Dec	White-winged Lark 312

1908

1 Jan White-winged Lark 313
10 Mar Two-barred Crossbill 514
10 Mar Two-barred Crossbill 515
20 Apr Killdeer 118
21 Apr Killdeer 119
22 Apr Killdeer 120
26 May Western Large-billed Reed Bunting 534
3 Jun Black-headed Wagtail 466
10 Jun Red-footed Falcon 80
22 Jun Golden Oriole 322
18 Jul Upland Sandpiper 140
22 Jul †Upland Sandpiper 551
3 Aug †Alpine Swift 563
15 Aug Solitary Sandpiper 149
4 Sep Bulwer's Petrel 25
19 Oct Mediterranean Shearwater 20
7 Nov Thick-billed Nutcracker 328

1909

30 Jan Black-throated Thrush 346
3 Feb Thick-billed Nutcracker 329
4 Mar Thick-billed Nutcracker 330
4 Mar Pine Grosbeak 506
4 Mar Pine Grosbeak 507
14 Apr Pectoral Sandpiper 185
17 Apr Pectoral Sandpiper 186
21 Apr Lesser Grey Shrike 471
21 Apr Lesser Grey Shrike 472
24 Apr Siberian Stonechat 378
29 Apr Red-throated Pipit 449
5 May Black-headed Bunting 521
16 May Red-rumped Swallow 321
21 May Brown Flycatcher 424
23 May Black-headed Wagtail 467
26 May Black-headed Wagtail 468
31 May Grey-headed Wagtail 459
4 Jun Brown-backed Warbler 418
16 Jun Marsh Sandpiper 163
18 Jun Marsh Sandpiper 164
29 Jun Corsican Woodchat Shrike 487
Summer †Aquatic Warbler 575
2 Sep Black Wheatear 374
3 Sep Broad-billed Sandpiper 197
11 Sep Eastern Little Bustard 100
16 Sep Black Wheatear 375
6 Oct Sabine's Gull 241

1910

7 Feb Ivory Gull 223
11 Feb Ivory Gull 224
30 Mar Rustic Bunting 532
1 Apr Rock Bunting 525
1 Apr Rock Bunting 526
13 May Brown-backed Warbler 419
25 May Sociable Plover 107
26 May Sociable Plover 108
26 May Sociable Plover 109
27 May Sociable Plover 110
May †Sociable Plover 547
19 Jun Golden Oriole 323
1 Jul Marsh Sandpiper 165
21 Sep Slender-billed Curlew 142
21 Sep Slender-billed Curlew 143
23 Sep Slender-billed Curlew 144
Sep †Slender-billed Curlew 552
3 Oct †Black-winged Stilt 556
9 Oct Black-winged Stilt 198

1911

2 Jan South European Grey Shrike 469
17 Jan Red-crested Pochard 53
17 Jan Red-crested Pochard 54
17 Jan Red-crested Pochard 55
Jan/Feb †Red-crested Pochard 544
5 Feb Red-crested Pochard 56
10 Feb Red-crested Pochard 57
15 Mar Black-throated Thrush 347
24 Mar Great Black-headed Gull 228
12 Apr Bee-eater 292
12 Apr Grey-headed Wagtail 460
17 Apr Isabelline Wheatear 370
5 May Cream-coloured Courser 218
5 May Cream-coloured Courser 219
12 May Collared Flycatcher 425
13 May Collared Flycatcher 426
15 May White-spotted Bluethroat 382
17 May White-spotted Bluethroat 383
23 May Alpine Ring Ouzel 348
29 May White-winged Black Tern 250
29 May White-winged Black Tern 251
29 May White-winged Black Tern 252
29 May †White-winged Black Tern 562
1 Jun White-winged Black Tern 253

rn	White-winged Black Tern 254	22 Sep	Short-toed Lark 320
ll	Caspian Plover 124	21 Oct	Eastern Little Bustard 101
ll	Caspian Plover 125	24 Oct	Great Shearwater 17
ll	Woodchat Shrike 482	24 Oct	Bulwer's Petrel 26
ll	†Great Black-headed Gull 557	27 Oct	Madeiran Little Shearwater 9
gp	Rock Thrush 352	15 Nov	Madeiran Little Shearwater 10
gp	Rock Thrush 353	2 Dec	Slender-billed Nutcracker 331
gp	Short-toed Lark 319		

1912

rn	Ferruginous Duck 58	23 May	Terek Sandpiper 170
rn	Ferruginous Duck 59	23 May	Terek Sandpiper 171
rn	†Ferruginous Duck 545	24 May	Terek Sandpiper 172
ar	Isabelline Wheatear 371	25 May	Terek Sandpiper 173
ar	Sabine's Gull 242	22 Jun	Rose-coloured Starling 492
pr	Eastern Large-billed Reed Bunting 536	16 Sep	Baird's Sandpiper 178
		22 Sep	White-spotted Bluethroat 384
pr	Grey-headed Wagtail 463	28 Oct	Eastern Little Bustard 102
pr	Black-headed Bunting 522	1 Nov	Wallcreeper 338
ay	Dowitcher 136	26 Dec	Slender-billed Nutcracker 332
ay	Lesser Grey Shrike 473	27 Dec	Great Shearwater 18
ay	Lesser Grey Shrike 474	28 Dec	Slender-billed Nutcracker 333
ay	Isabelline Wheatear 372	Dec	†Slender-billed Nutcracker 571
ay	Western Black-eared Wheatear 360	—	Grey-headed Wagtail 461
ay	Western Black-eared Wheatear 361	—	Grey-headed Wagtail 462

1913

eb	Cream-coloured Courser 220	21 Jun	Gull-billed Tern 265
eb	Cream-coloured Courser 221	23 Jun	Gull-billed Tern 266
ar	Great Black-headed Gull 229	19 Jul	Little Crake 92
ar	Night Heron 43	25 Jul	Little Crake 93
pr	Black-winged Pratincole 214	8 Sep	Mediterranean Black-headed Gull 232
ay	Black-winged Pratincole 215		
ay	Black-winged Pratincole 216	15 Sep	Black-winged Stilt 199
ay	Black-winged Pratincole 217	20 Sep	Black-winged Stilt 200
ay	Eastern Desert Wheatear 355	20 Sep	Rufous Warbler 416
ay	Spotted Sandpiper 154	Oct	†Squacco Heron 543
ay	Red-throated Pipit 450	3 Nov	Bonaparte's Gull 238
ay	Red-throated Pipit 451	13 Nov	Squacco Heron 35
ay	Spotted Sandpiper 155	27 Dec	Madeiran Little Shearwater 11
an	Caspian Tern 267	27 Dec	Eastern Little Bustard 103
an	Gull-billed Tern 264		

1914

n	Tengmalm's Owl 279	25 Jan	Pine Grosbeak 510
n	Tengmalm's Owl 280	26 Jan	Slender-billed Gull 226
n	Ivory Gull 215	16 Feb	Slender-billed Nutcracker 334
n	Two-barred Crossbill 516	14 Mar	North Atlantic Shearwater 22
n	Two-barred Crossbill 517	16 Mar	Bulwer's Petrel 27
n	†Two-barred Crossbill 592	30 Mar	Caspian Plover 126
n	Pine Grosbeak 508	7 Apr	Lesser Kestrel 85
n	Pine Grosbeak 509	9 Apr	Sooty Tern 271
n	Two-barred Crossbill 518	10 Apr	Sooty Tern 272

17 Apr Solitary Sandpiper 150
18 Apr Little Ringed Plover 116
20 Apr Bonaparte's Gull 239
21 Apr Eastern Black-eared Wheatear 367
23 Apr Asiatic Golden Plover 128
23 Apr Asiatic Golden Plover 129
23 Apr Asiatic Golden Plover 130
23 Apr †Asiatic Golden Plover 550
24 Apr Ferruginous Duck 60
26 Apr Bonaparte's Gull 240
30 Apr †Sociable Plover 548
30 Apr Eastern Black-eared Wheatear 368
30 Apr Tawny Pipit 443
Apr Squacco Heron 36
Apr †Bonaparte's Gull 560
5 May Rüppell's Warbler 413
5 May Rüppell's Warbler 414
6 May Lesser Grey Shrike 475
9 May Sociable Plover 111
11 May Sociable Plover 112
18 May Sociable Plover 113
23 May Little Bittern 48
10 Jun Alpine Swift 281
14 Jun Alpine Swift 282
24 Jun Slender-billed Gull 227
3 Jul Upland Sandpiper 141
8 Aug Rose-coloured Starling 493
8 Aug †Rose-coloured Starling 588
15 Aug Lesser Yellowlegs 161
15 Aug Lesser Yellowlegs 162
25 Aug Pectoral Sandpiper 187
26 Aug Icterine Warbler 404
Aug †Rose-coloured Starling 589
10 Sep Slender-billed Curlew 145
10 Sep Aquatic Warbler 397
10 Sep Aquatic Warbler 398
23 Sep Grey-rumped Sandpiper 168
23 Sep Baird's Sandpiper 179
27 Sep Grey-rumped Sandpiper 169
21 Oct Noddy Tern 274
23 Oct Yellow-browed Warbler 422
9 Nov White's Thrush 349
2 Dec Wilson's Petrel 1
4 Dec Cape Verde Little Shearwater 13
4 Dec Rustic Bunting 533

1915

2 Jan Cape Verde Little Shearwater 14
6 Jan Western Large-billed Reed Bunting 535
25 Jan Dusky Thrush 340
30 Jan Black Lark 305
Jan †Black Lark 568
1 Feb Black Lark 306
7 Feb Dusky Thrush 341
20 Feb Dusky Thrush 342
22 Feb Dusky Thrush 343
Feb/Mar †Dusky Thrush 572
3 Mar Dusky Thrush 344
3 Mar Dusky Thrush 345
6 Apr Rock Bunting 527
12 Apr Moustached Warbler 389
5 May Western Black-eared Wheatear 362
6 May Sabine's Gull 243
7 May Brown-backed Warbler 420
20 May Olivaceous Warbler 405
24 May Marsh Sandpiper 166
24 May Marsh Sandpiper 167
26 May Terek Sandpiper 174
28 May Terek Sandpiper 175
28 May Terek Sandpiper 176
7 Jun North African Black Wheatear 376
25 Jun Great Black-headed Gull 230
15 Jul Mediterranean Black-headed Gull 233
16 Jul Mediterranean Black-headed Gull 234
16 Jul Mediterranean Black-headed Gull 235
21 Jul Mediterranean Black-headed Gull 236
Jul †Mediterranean Black-headed Gull 558
4 Aug Caspian Tern 268
4 Aug Caspian Tern 269
6 Aug Pectoral Sandpiper 188
20 Sep Asiatic Golden Plover 131
20 Sep Asiatic Golden Plover 132
20 Sep Asiatic Golden Plover 133
20 Sep Asiatic Golden Plover 134
4 Oct Greater Yellowlegs 160
12 Oct Roller 299
30 Oct Western Black-eared Wheatear 363
3 Nov †White-winged Lark 570
10 Nov King Eider 62
10 Nov White-winged Lark 314
11 Nov †Mediterranean Black-headed Gull 559
12 Nov Killdeer 121
12 Nov Killdeer 122
12 Nov †Killdeer 549
27 Dec Balearic Shearwater 6
27 Dec White's Thrush 350
28 Dec Wallcreeper 339

1916

Feb White's Thrush 351
Feb Snow Finch 540
Feb Snow Finch 541
Feb Snow Finch 542
Mar White-winged Lark 315
Mar White-winged Lark 316
Mar White-winged Lark 317
Apr White-winged Lark 318
Apr Semipalmated Ringed Plover 114
Apr White-rumped Sandpiper 182
May Collared Flycatcher 427
May Collared Flycatcher 428
May Calandra Lark 307
16 May Rose-coloured Starling 494
17 May Calandra Lark 308
17 May †Calandra Lark 569
30 May Solitary Sandpiper 151
30 May Savi's Warbler 388
3 Jun Caspian Tern 270
21 Jun Cetti's Warbler 387
24 Aug Eastern Great Reed Warbler 393
21 Sep Orphean Warbler 412
22 Sep American Golden Plover 127
3 Oct Red-breasted Flycatcher 430
18 Oct Dusky Warbler 423
30 Oct Wilson's Petrel 2

1917

Feb Pine Grosbeak 511
Feb †Two-barred Crossbill 593
May Western Black-eared Wheatear 364
May Glossy Ibis 51
May Western Black-eared Wheatear 365
10 May Grey-headed Wagtail 464
2 Jun Alpine Swift 283
10 Jul Rose-coloured Starling 495
13 Jul Great Black-headed Gull 231

1918

Jan American Bittern 50
Apr Scops Owl 277
Apr Scops Owl 278
May Tawny Pipit 444
May Night Heron 44
May Ruddy Shelduck 67
May Spotted Sandpiper 156
23 May Great Spotted Cuckoo 276
May Ruddy Shelduck 66
May Whiskered Tern 262
May Whiskered Tern 263
2 Jun Little Crake 94
8 Jun Brown-backed Warbler 421
Jun Woodchat Shrike 483

1919

Feb Long-tailed Rose Finch 498
Feb Long-tailed Rose Finch 499
Feb Long-tailed Rose Finch 500
Mar Belted Kingfisher 284
Mar Belted Kingfisher 285
Apr Eastern Little Bustard 104
26 Apr Masked Wagtail 453
18 May Slender-billed Curlew 146
18 May Slender-billed Curlew 147
22 May Pratincole 210
29 Aug †Killdeer 123

1920

Jan Royal Tern 273
May Black-winged Stilt 201
May Black-winged Stilt 202
May Spotted Sandpiper 157
May Spotted Sandpiper 158
May Spotted Sandpiper 159
May Red-footed Falcon 81
3 Jun Woodchat Shrike 484
14 Jun Olivaceous Warbler 406
19 Jun Olivaceous Warbler 407
15 Aug Cream-coloured Courser 222
27 Aug †Broad-billed Sandpiper 554
10 Sep Isabelline Wheatear 373
9 Nov North Atlantic Shearwater 23

1921

May Little Bittern 49
1 Jun Little Crake 95

1922

21 Apr Tawny Pipit 445
1 May Little Ringed Plover 117
5 May Collared Flycatcher 429
5 May †Collared Flycatcher 580
15 May White-winged Black Tern 255
17 May Red-throated Pipit 452
22 Nov Glossy Ibis 52
26 Dec Alpine Accentor 431
26 Dec Alpine Accentor 432
26 Dec Alpine Accentor 433

1923

28 Feb Slender-billed Nutcracker 335
9 Mar Madeiran Little Shearwater 12
9 Mar Cape Verde Little Shearwater 15
30 Mar Western Desert Wheatear 354
23 Apr Alpine Accentor 434
9 Oct †Alpine Swift 564
Nov Mediterranean Black-headed Gull 237

1924

23 Jan Slender-billed Nutcracker 336
15 May Eastern Black-eared Wheatear 369
10 Aug Squacco Heron 37
2 Sep Red-footed Falcon 82

1925

10 Jan Ferruginous Duck 61
1 May Wilson's Phalarope 203
30 May Woodchat Shrike 485
19 Jun Rose-coloured Starling 496
Jun †Alpine Swift 565
21 Sep Eastern Little Bustard 105

1929

19 Oct Pectoral Sandpiper 189

1930

29 Oct Noddy Tern 275

Appendix D—Scientific names of species mentioned in the texts of both Hastings papers

Trinomials are used only where the race concerned is of significance in this particular context

Albatrosses (Diomedeidae)
Wilson's Petrel (*Oceanites oceanicus*)
Leach's Petrel (*Oceanodroma leucorrhoa*)
Madeiran Petrel (*Oceanodroma castro*)
Storm Petrel (*Hydrobates pelagicus*)
Manx Shearwater (*Procellaria puffinus*)
Balearic Shearwater (*Procellaria puffinus mauretanicus*)
Madeiran Little Shearwater (*Procellaria baroli baroli*)
Cape Verde Little Shearwater (*Procellaria baroli boydi*)
Audubon's Shearwater (*Procellaria Pherminieri*)
Great Shearwater (*Procellaria gravis*)
Mediterranean Shearwater (*Procellaria diomedea diomedea*)
North Atlantic Shearwater (*Procellaria diomedea borealis*)
Sooty Shearwater (*Procellaria grisea*)
Bulwer's Petrel (*Bulweria bulwerii*)
Cape Pigeon (*Daption capensis*)
Fulmar (*Fulmarus glacialis*)
Gannet (*Sula bassana*)
Purple Heron (*Ardea purpurea*)
Little Egret (*Egretta garzetta*)
Great White Heron (*Egretta alba*)
Squacco Heron (*Ardeola ralloides*)
Night Heron (*Nycticorax nycticorax*)
Little Bittern (*Ixobrychus minutus*)
Bittern (*Botaurus stellaris*)
American Bittern (*Botaurus lentiginosus*)
White Stork (*Ciconia ciconia*)
Black Stork (*Ciconia nigra*)

oonbill (*Platalea leucorodia*)
ossy Ibis (*Plegadis falcinellus*)
e-winged Teal (*Anas discors*)
l-crested Pochard (*Netta rufina*)
rruginous Duck (*Aythya nyroca*)
f Scoter (*Melanitta perspicillata*)
g Eider (*Somateria spectabilis*)
ddy Shelduck (*Casarca ferruginea*)
gh-legged Buzzard (*Buteo lagopus*)
shawk (*Accipiter gentilis*)
e (*Milvus milvus*)
yptian Black Kite (*Milvus migrans egyptius*)
ite-tailed Eagle (*Haliaëtus albicilla*)
er Falcon (*Falco cherrug*)
: Falcon (*Falco rusticolus*)
l-footed Falcon (*Falco vespertinus*)
sser Kestrel (*Falco naumanni*)
dlon's Crake (*Porzana pusilla*)
dle Crake (*Porzana parva*)
erican Purple Gallinule (*Porphyrula martinica*)
ttern Little Bustard (*Otis tetrax orientalis*)
iable Plover (*Chettusia gregaria*)
ipalmated Ringed Plover (*Charadrius hiaticula semipalmatus*)
dle Ringed Plover (*Charadrius dubius*)
ian Little Ringed Plover (*Charadrius dubius jerdoni*)
deer (*Charadrius vociferus*)
pian Plover (*Charadrius asiaticus*)
erican Golden Plover (*Charadrius dominicus dominicus*)
atic Golden Plover (*Charadrius dominicus fulvus*)
g-billed Dowitcher (*Limnodromus scolopaceus*)
witcher (*Limnodromus* sp.)
at Snipe (*Gallinago media*)
and Sandpiper (*Bartramia longicauda*)
der-billed Curlew (*Numenius tenuirostris*)
tary Sandpiper (*Tringa solitaria*)
tted Sandpiper (*Tringa hypoleucos macularia*)
ater Yellowlegs (*Tringa melanoleuca*)
er Yellowlegs (*Tringa flavipes*)
enshank (*Tringa nebularia*)
sh Sandpiper (*Tringa staguatilis*)
-rumped Sandpiper (*Tringa brevipes*)
k Sandpiper (*Tringa terek*)
d's Sandpiper (*Calidris bairdii*)
te-rumped Sandpiper (*Calidris fuscicollis*)
oral Sandpiper (*Calidris melanotos*)
p-tailed Sandpiper (*Calidris acuminata*)
lin (*Calidris alpina*)
ipalmated Sandpiper (*Calidris pusilla*)
Buff-breasted Sandpiper (*Tryngites subruficollis*)
Broad-billed Sandpiper (*Limicola falcinellus*)
Avocet (*Recurvirostra avosetta*)
Black-winged Stilt (*Himantopus himantopus*)
Red-necked Phalarope (*Phalaropus lobatus*)
Wilson's Phalarope (*Phalaropus tricolor*)
Pratincole (*Glareola pratincola*)
Black-winged Pratincole (*Glareola "nordmanni"*)
Cream-coloured Courser (*Cursorius cursor*)
Pomarine Skua (*Stercorarius pomarinus*)
Long-tailed Skua (*Stercorarius longicaudus*)
Ivory Gull (*Pagophila eburnea*)
Iceland Gull (*Larus glaucoides*)
Slender-billed Gull (*Larus genei*)
Great Black-headed Gull (*Larus ichthyaëtus*)
Mediterranean Black-headed Gull (*Larus melanocephalus*)
Bonaparte's Gull (*Larus philadelphia*)
Sabine's Gull (*Xema sabini*)
White-winged Black Tern (*Chlidonias leucopterus*)
Whiskered Tern (*Chlidonias hybrida*)
Gull-billed Tern (*Gelochelidon nilotica*)
Caspian Tern (*Hydroprogne caspia*)
Roseate Tern (*Sterna dougallii*)
Sooty Tern (*Sterna fuscata*)
Bridled Tern (*Sterna anaethetus*)
Royal Tern (*Sterna maxima*)
Noddy Tern (*Anous stolidus*)
Great Auk (*Alca impennis*)
Black Guillemot (*Cepphus grylle*)
Pallas's Sandgrouse (*Syrrhaptes paradoxus*)
Great Spotted Cuckoo (*Clamator glaudarius*)
Yellow-billed Cuckoo (*Coccyzus americanus*)
Scops Owl (*Otus scops*)
Snowy Owl (*Nyctea scandiaca*)
Tengmalm's Owl (*Aegolius funereus*)
Alpine Swift (*Apus melba*)
Belted Kingfisher (*Ceryle alcyon*)
Bee-eater (*Merops apiaster*)
Roller (*Coracias garrulus*)
Hoopoe (*Upupa epops*)
Three-toed Woodpecker (*Picoides tridactylus*)
Black Lark (*Melanocorypha yeltoniensis*)
Calandra Lark (*Melanocorypha calandra*)
White-winged Lark (*Melanocorypha leucoptera*)
Short-toed Lark (*Calandrella cinerea brachydactyla*)
Crested Lark (*Galerida cristata*)
Red-rumped Swallow (*Hirundo daurica*)
Golden Oriole (*Oriolus oriolus*)
Indian Golden Oriole (*Oriolus oriolus kundoo*)
Thick-billed Nutcracker (*Nucifraga caryocatactes caryocatactes*)

Slender-billed Nutcracker (*Nucifraga caryocatactes macrorhynchos*)
Chough (*Pyrrhocorax pyrrhocorax*)
Bearded Tit (*Panurus biarmicus*)
Wallcreeper (*Tichodroma muraria*)
British Dipper (*Cinclus cinclus gularis*)
Dusky Thrush (*Turdus eunomus*)
Black-throated Thrush (*Turdus ruficollis atrogularis*)
Alpine Ring Ouzel (*Turdus torquatus alpestris*)
White's Thrush (*Turdus dauma*)
Rock Thrush (*Monticola saxatilis*)
Desert Wheatear (*Oenanthe deserti deserti*)
Western Desert Wheatear (*Oenanthe deserti homochroa*)
Eastern Desert Wheatear (*Oenanthe deserti atrogularis*)
Western Black-eared Wheatear (*Oenanthe hispanica hispanica*)
Eastern Black-eared Wheatear (*Oenanthe hispanica melanoleuca*)
Isabelline Wheatear (*Oenanthe isabellina*)
Black Wheatear (*Oenanthe leucura leucura*)
North African Black Wheatear (*Oenanthe leucura syenitica*)
Siberian Stonechat (*Saxicola torquata maura*)
Indian Stonechat (*Saxicola torquata indica*)
Thrush Nightingale (*Luscinia luscinia*)
Red-spotted Bluethroat (*Cyanosylvia svecica svecica*)
White-spotted Bluethroat (*Cyanosylvia svecica cyanecula*)
Cetti's Warbler (*Cettia cetti*)
Lanceolated Warbler (*Locustella lanceolata*)
Savi's Warbler (*Locustella luscinioides*)
Moustached Warbler (*Lusciniola melanopogon*)
Great Reed Warbler (*Acrocephalus arundinaceus arundinaceus*)
Eastern Great Reed Warbler (*Acrocephalus arundinaceus orientalis*)
Aquatic Warbler (*Acrocephalus paludicola*)
Melodious Warbler (*Hippolais polyglotta*)
Icterine Warbler (*Hippolais icterina*)
Olivaceous Warbler (*Hippolais pallida*)
Barred Warbler (*Sylvia nisoria*)
Orphean Warbler (*Sylvia hortensis*)
Rüppell's Warbler (*Sylvia rüppelli*)
Sardinian Warbler (*Sylvia melanocephala*)
Subalpine Warbler (*Sylvia cantillans*)
Rufous Warbler (*Agrobates galactotes galactotes*)
Brown-backed Warbler (*Agrobates galactotes syriaca*)
Greenish Warbler (*Phylloscopus trochiloides*)
Scandinavian Chiffchaff (*Phylloscopus collybita abietinus*)
Siberian Chiffchaff (*Phylloscopus collybita tristis*)
Arctic Warbler (*Phylloscopus borealis*)
Yellow-browed Warbler (*Phylloscopus inornatus*)
Dusky Warbler (*Phylloscopus fuscatus*)
Firecrest (*Regulus ignicapillus*)
Brown Flycatcher (*Muscicapa latirostris*)
Collared Flycatcher (*Muscicapa albicollis*)
Red-breasted Flycatcher (*Muscicapa parva*)
Alpine Accentor (*Prunella collaris*)
Meadow Pipit (*Anthus pratensis*)
Richard's Pipit (*Anthus richardi*)
Tawny Pipit (*Anthus campestris*)
Red-throated Pipit (*Anthus cervinus*)
Water Pipit (*Anthus spinoletta spinoletta*)
Masked Wagtail (*Motacilla alba personata*)
Yellow-headed Wagtail (*Motacilla citreola*)
Grey-headed Wagtail (*Motacilla flava thunbergi*)
Black-headed Wagtail (*Motacilla flava feldegg*)
Sykes's Wagtail (*Motacilla flava beema*)
Great Grey Shrike (*Lanius excubitor*)
South European Grey Shrike (*Lanius excubitor meridionalis*)
Lesser Grey Shrike (*Lanius minor*)
Woodchat Shrike (*Lanius senator*)
Corsican Woodchat Shrike (*Lanius senator badius*)
Masked Shrike (*Lanius nubicus*)
Red-tailed Shrike (*Lanius cristatus isabellinus/phoenicuroides*)
Northern Waterthrush (*Seiurus noveboracensis*)
Rose-coloured Starling (*Sturnus roseus*)
Serin (*Serinus canarius*)
Northern Bullfinch (*Pyrrhula pyrrhula pyrrhula*)
Long-tailed Rose Finch (*Uragus sibiricus*)
Scarlet Grosbeak (*Carpodacus erythrinus*)
Pine Grosbeak (*Pinicola enucleator*)
Two-barred Crossbill (*Loxia leucoptera*)
Corn Bunting (*Emberiza calandra*)
Black-headed Bunting (*Emberiza melanocephala*)
Ortolan Bunting (*Emberiza hortulana*)
Rock Bunting (*Emberiza cia*)
Rustic Bunting (*Emberiza rustica*)
Little Bunting (*Emberiza pusilla*)
Western Large-billed Reed Bunting (*Emberiza schoeniclus compilator*)
Eastern Large-billed Reed Bunting (*Emberiza schoeniclus tschusii*)
Snow Finch (*Montifringilla nivalis*)

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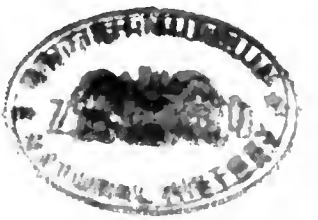
British Birds



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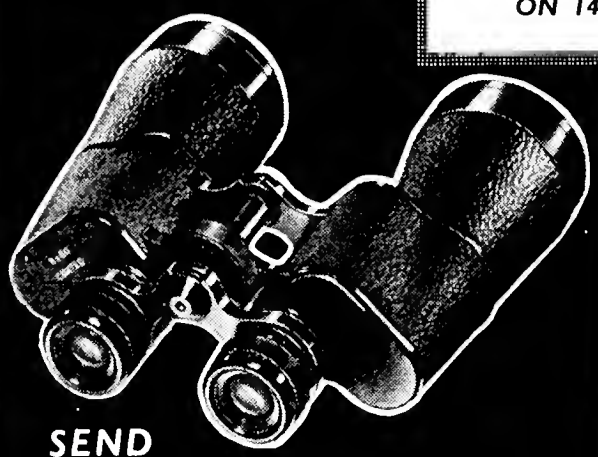

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British Birds

Vol. 55 No. 9

SEPTEMBER 1962

Behaviour of Pied Flycatchers during an eclipse of the sun

By K. Elgmork

University of Oslo, Blindern, Norway

THERE ARE FEW PRECISE RECORDS of the behaviour of birds during eclipses of the sun, when light intensities may be lower than those which inhibit feeding and other regular activities on normal evenings. This short paper therefore sets out to record some observations which my wife and I made on a pair of Pied Flycatchers (*Muscicapa hypoleuca*) in Norway during the eclipse of the sun on 30th June 1954. The birds had a nest with nearly full-grown young in a box fastened to a branch of an apple-tree about 2.2 metres (7 feet 2 inches) above the ground. Foliage covered the nest-box which was thus always in shadow. The place was a garden in the small town of Hönefoss, situated about 40 kilometres (25 miles) to the north-west of Oslo (60°10′N, 10°15′E) and about 70 metres (230 feet) above sea level.

The site was about 40 kilometres from the zone of total eclipse, which meant that the sun was 99% covered at 13.39 hours Mid-European Time (Grönstrand 1950). During the darkest phase of the eclipse the light conditions were so poor that it was difficult to distinguish the male Pied Flycatcher from the female at a distance of four metres (13 feet). We also registered a fall in temperature and, according to Spinnangr (1958), it can be estimated that this was about 2° C. We made our observations at a distance of seven metres (23 feet) from the nest, using another apple-tree as cover. Detailed records were kept for about an hour on each side of the maximum eclipse. The weather at first was partly cloudy with periods of sunshine and drifting clouds, but in the second hour it was mostly clear and sunny.

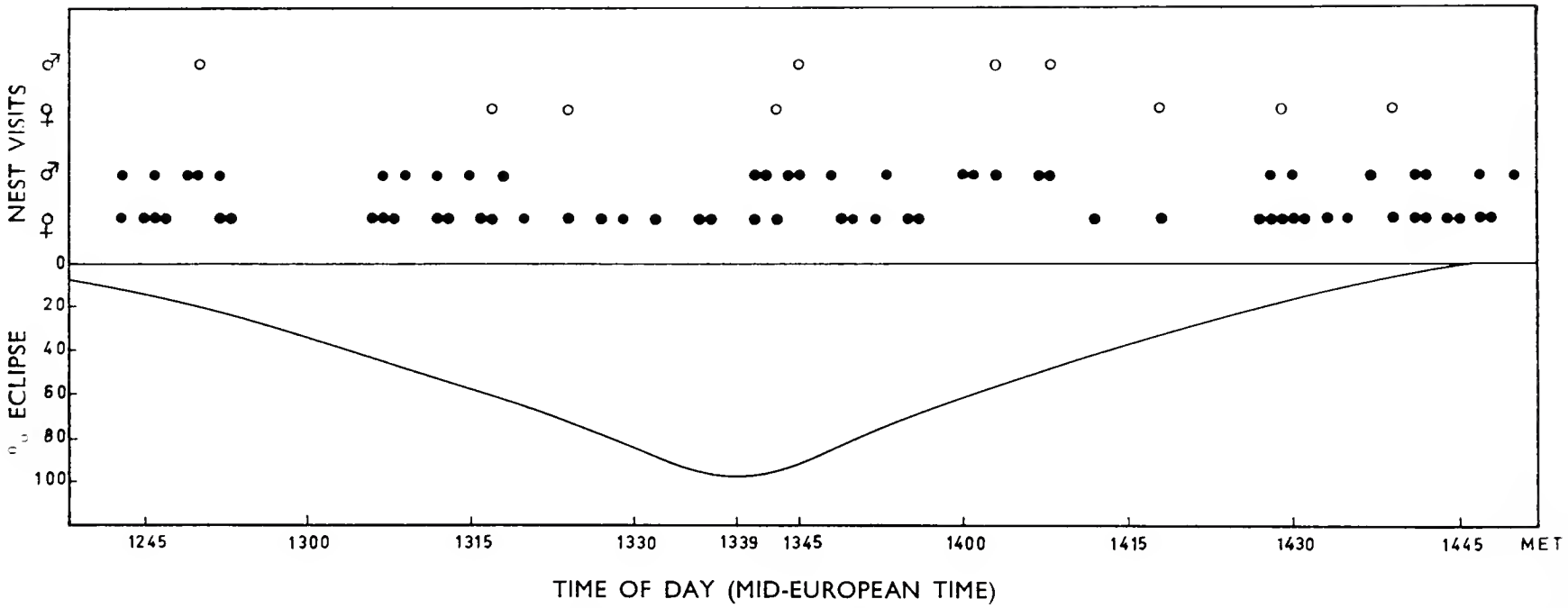

FIG. 1. Activity of a pair of Pied Flycatchers (*Muscicapa hypoleuca*) during an eclipse of the sun, Norway, June 1954. The black dots mark feeding visits and the open rings the removal of faeces, while the graph underneath shows the percentage of the eclipse (99% was reached at 13.39 hours) Mid-European Time is one hour ahead of Greenwich Mean Time and so coincides with British Summer Time

Fig. 1 plots the feeding visits and the removal of faeces, by male and female separately, in relation to the percentage of the eclipse. It can be seen that both activities were quite regular throughout the whole period of observation. At times, particularly around 13.00 hours and again at about 14.15 hours, there were short spells when neither parent came to the nest, but these were well before and after the darkest phase. The female, in fact, showed no decrease in the frequency of her visits during the period of the maximum eclipse. The male stayed away for the twenty minutes just before the maximum eclipse, but he started a period of very frequent visits only two minutes after the light was at its lowest. It seems likely that his absence for those twenty minutes was due to unconnected activities, because he was frequently heard uttering alarm notes in the vicinity. These alarm notes, which were most frequent during the first hour, were almost the only sounds made by the male. Only two song phrases were heard, one at 13.12 hours and the other at 14.01 hours.

The feeding frequency during the eclipse was of the same order as we have observed at this nest-box in other years, at the same time of the day and towards the end of the nest-period. In 1947, for example, the frequency varied from 24 to 38 visits per hour, while the average during the eclipse was 34 per hour. The greatly reduced light during the 99% eclipse thus appeared to have had no effect upon the feeding of these Pied Flycatchers. This seems all the more remarkable when observations from another year indicate that feeding and other activities are brought to an end in the evening when there is still more light than there was during the darkest phase of the eclipse.

It is also interesting to note that the birds must presumably have had no difficulty in finding food. Yet other observers commented on changes in the behaviour of insects during the same eclipse. Woyke (1955) noted a definite reaction by bees when the sun was 95% obscured, and Löken (1954) observed a reduction in the number of visiting bumble-bees as much as 40 minutes before the total eclipse.

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Radar films of migration over eastern England

By David Lack and E. Eastwood

(Plates 65-66)

INTRODUCTION

AT INTERVALS FROM August 1958 to January 1962 inclusive, the Research Laboratories of Marconi's Wireless Telegraphy Co. Ltd., at Great Baddow, Chelmsford, Essex, have taken films of a radar display by time-lapse photography and many of these provide a clear record of bird migration; some were shown at the British Ornithologists' Union conference at York in March 1961. The radar station is situated at Bushy Hill, Essex, and when migrants flew high they could usually be tracked between north Norfolk and south Sussex, as well as in a small part of the Pas de Calais. Most of the area covered was over the land, but it included a small part of the North Sea east of Suffolk and Essex, the Thames estuary, the Straits of Dover and a section of the English Channel south of Sussex. Hence the cover was south of, but overlapped with, that of the R.A.F. station in Norfolk from which still photographs of the radar display were analysed by Tedd and Lack (1958) and Lack (1959 ab, 1960).

The films analysed here provide a much more detailed record of bird-echoes than the still pictures just mentioned, particularly with respect to the very small and dense echoes of night-migrants, mainly warblers, in early autumn and late spring. They also have certain advantages over direct observation of a radar display, in that the record can be examined over and over again, but the speeding-up means that some events happen so fast that they are more easily seen on a display at the time. The films were particularly valuable for revealing disoriented movements and changes in direction, also for preparing diagrams of movements. Owing partly to the great expense involved, they provide only a sample, not a full record, so that for studying the influence of the weather on migration, the much more extensive data obtained by individual observers at the Norfolk station, an account of which is in preparation, are more satisfactory.

We are extremely grateful to the Photographic and Propagation Sections of the Great Baddow Laboratory and to the staff of the Marconi radar station at Bushy Hill for their care and skill in the preparation of the films.

TECHNIQUES

The experimental radar which has been used in this work is sited at a height of 250 feet on Bushy Hill in Essex and clear viewing to the horizon is obtained on all azimuths. Further technical details are given in Eastwork *et al.* (1962). The radar signals are displayed on a 12-inch Plan Position Indicator whose radius corresponds to a distance of 80 miles; this scale has been found to yield the greatest information on bird movements. The P.P.I. console is fitted with a 16 mm. cine camera whose film transport mechanism is linked to the radar aerial. It is arranged that the camera shutter remains open during one complete scan of the antenna, i.e. 15 seconds, so that one radar picture is recorded on a single frame of the film. A triggering impulse from the antenna now closes the shutter for 60 milliseconds, during which time the film is transported through one frame. When such a film is projected at 16 frames per second, the time is compressed to $\frac{1}{240}$ and the movements of the birds are rendered vividly apparent. This radar is fitted with a doppler discriminator, which reduces greatly the signals from stationary targets as compared with the echoes from aircraft and birds; the use of this device in association with the speeded film technique permits complex bird movements to be unravelled, even in the presence of clutter from ground echoes.

The fact that successive frames of the film are secured at 15-second intervals means that the ground speeds of particular angels can be measured directly from the projected image. The velocity of birds along a curvilinear track may also be determined by plotting the movement on a vertical screen and subsequently estimating the track-length by a mapping wheel. This process has even been automated by permitting the application of the wheel directly to the projection screen, this contact causing an electronic counter to record the number of frames going to form the track in question.

SURVEY OF MIGRATION THROUGHOUT THE YEAR

The films analysed here, omitting a few on which it was impossible to see whether or not birds were migrating, covered 1,463 hours, mainly in separate periods of about two hours each around sunrise or sunset, with a very few in the middle of the day, and 33 continuous 24-hour records. Including the morning and evening observations from each 24-hour watch, but excluding the records for the middle of the day, there were 279 separate observations in all, 71% for the morning and the rest for the evening, distributed rather irregularly through the year, but with at least 11 in each month. For each observation, the density of migration in each direction was assessed on the arbitrary scale from 0 to 3 used earlier by Tedd and Lack (1958)

and Lack (1959b, 1960). Although the properties of the present equipment were somewhat different from those of the R.A.F. station, the two gave nearly similar results for the density of bird-echoes on the occasions when they could be directly compared. However, the still photographs used in the papers quoted referred solely to the North Sea, and not to the land, and did not reveal the extremely small and dense echoes associated with small Passerine night-migrants. For these two reasons, the movements headed between NNE and NNW in spring and between SSE and SSW in autumn were much more prominent in the present record than in the preliminary survey for Norfolk in the papers quoted. This bias in the early records has, however, been corrected by personal inspection of a radar display at the R.A.F. station concerned between 1958 and 1962, an account of which is appearing in *The Ibis*. In comparing the average densities in Tables 1 and 2 with those for the Norfolk station, it should also be kept in mind that in Tables 1 and 2 the figures for night and day have been combined, that there is in general much more migration by night than day, and that nearly three-quarters of the present observations were made by day, so that the averages are lower than for the night alone.

Table 1—Monthly variations in migration over eastern England, August 1958-January 1962

The density of migration is expressed on the same arbitrary scale of 0-3 as in Tedd and Lack (1958) and Lack (1959, 1960); x indicates that some migration was recorded, but that the average density was less than 0.05, and a dot means no migration. Since the averages are based on 2½ times as many morning as evening figures, and since more migration occurs by night than day, they are lower than they would have been if they had referred to an equal number of nights and days

Month	Number of observations	Mean density of migration per observation					
		E	W	NNE	SSW	NNW	SSE
January	46	0.4	0.2	0.3	0.5	0.1	0.1
February*	35	0.6	0.2	0.1	x	0.1	.
March*	50	1.7	0.1	0.3	0.1	0.2	0.2
April	20	1.7	0.2	0.5	0.1	0.6	0.1
May	18	0.3	0.2	1.1	0.1	0.7	x
June	13	0.7	0.7	0.2	x	0.1	.
July	11	0.3	0.9	.	0.3	.	0.5
August	12	0.4	0.6	.	0.4	.	1.4
September	11	0.9	0.9	.	0.5	0.1	0.9
October	30	0.2	0.4	0.1	0.6	x	0.5
November	13	0.2	0.5	.	0.7	x	0.2
December	20	0.1	0.9	0.1	0.6	x	0.2

*February covers the 1st-23rd only; the 24th-29th are included with March because this was done earlier (Lack 1960) and because big eastward departures often begin then.

Table 1 summarises the general picture of migration over eastern England as obtained from the present films. There are three main movements. The most conspicuous, as found earlier for Norfolk, is from west to east in spring and the reverse in autumn, and is presumed to consist of species which breed on the Continent and spend the winter in England. The chief of these are probably the Chaffinch (*Fringilla coelebs*), Starling (*Sturnus vulgaris*), Blackbird (*Turdus merula*), Song Thrush (*T. philomelos*) and Lapwing (*Vanellus vanellus*). Lapwings start their post-breeding movement at the end of May and the Passerine species do so in late September, while the return movements are largest between the end of February and mid-April. These movements are prominent both by night and by day. The second movement, NNW in spring and SSE in autumn, is much larger by night than by day and, because of the directions involved, is more conspicuous on the south than the east coast of England, though some birds travel between East Anglia and Belgium. The chief species involved are presumably British Passerine summer residents, notably warblers and other small night-migrants, and the movement is densest in late August and September and again in late April and May. The third movement, NNE in spring and SSW in autumn, occurs chiefly over south-eastern England, the Straits of Dover and the Pas de Calais. It is smaller than the other two, and presumably consists of species travelling between Scandinavia and Iberia. It includes both Passerines and waders and occurs chiefly at night, except that the waders start two or three hours before dark. In winter some of the biggest departures are only just west of south, but we have hesitantly included them with those SSW.

While the commonest movements are E, NNW and NNE in spring, and W, SSE and SSW in autumn, Table 1 shows that at least a few movements E, W and SSW occurred in every month of the year, while movements SSE occurred in most months. Hence apparent "reversed migrations", i.e. in the "wrong" direction for the time of year, are much more frequent than has generally been supposed, especially in spring. But northward movements in autumn occurred only rarely. The regularity of migration in the middle of summer and the middle of winter may also be noted.

In Table 2 the data have been grouped into five main periods in order to assess the possible influence of wind-direction. Even with the broad grouping adopted, the averages are based on totals too small for firm conclusions, but they strongly suggest that all types of movements in summer, autumn and winter, and also the reversed movements in spring, occur primarily, though not exclusively, with a more-or-less following wind, within some 45° of the heading of the birds. On the other hand, the big movements E in the early spring and NNW

Table 2—Relation of wind-direction to direction of migration

The comments under Table 1 also apply here; x indicates an average density of 0.02-0.05 and a dot means no (or virtually no) migration. No allowance was made for the speed of the wind, but days with an extremely light or variable wind have been excluded. The wind was very light on all days when it was between NNE and ENE in late spring. The direction of the wind was always that over eastern England, which was nearly (but not quite) always the same as in any area from which departures occurred

Direction of wind	Number of observations	Mean density of migration E	W	NNW	SSE	NNE	SSW
EARLY SPRING (24th February-15th April)							
NNE-ENE	7	0.8	0.3	.	0.3	.	0.1
ESE-SSE	15	1.4	0.1	0.5	0.2	0.3	x
WSW-SSW	32	2.0	x	0.4	x	0.5	.
WNW-NNW	8	2.0	.	.	0.6	.	0.3
LATE SPRING (20th April-31st May)							
NNE-ENE	10	0.2	0.3	0.9	0.2	0.9	0.2
ESE-SSE	5	0.2	0.1	0.5	.	1.1	.
WSW-SSW	3	0.8	.	0.2	.	1.0	.
WNW-NNW	2	0.9	.	0.5	x	0.8	.
SUMMER (June-July)							
NNE-ENE	6	0.1	1.2	.	.	.	0.5
ESE-SSE	3	0.2	1.0	.	.	0.3	.
WSW-SSW	6	1.3	0.5	0.3	.	0.8	x
WNW-NNW	7	0.8	0.5	x	0.7	. .	0.1
AUTUMN (August-November)							
NNE-ENE	9	0.1	1.4	.	0.2	.	1.1
ESE-SSE	7	.	1.4	.	0.7	.	0.4
WSW-SSW	28	0.5	0.2	0.07	0.2	0.05	0.08
WNW-NNW	17	0.4	0.2	.	1.5	.	1.0
WINTER (11th December-14th February)							
NNE-ENE	9	.	1.1	.	0.2	.	0.7
ESE-SSE	18	x	0.8	0.15	.	0.05	0.1
WSW-SSW	23	0.5	.	0.2	.	0.6	.
WNW-NNW	19	0.7	x	.	0.1	.	1.1

and NNE in late spring seemed little influenced by wind-direction. (But further observations are needed for NE winds in late spring as these were very light on all the days studied.) Because of the paucity of data, both departures and arrivals have been included in Table 2, but for nearly all arrivals the direction of the wind was similar in the area of departure to that over eastern England.

In mid-winter (bottom section of Table 2) there was a regular alternation between W movements with cold easterly winds and E movements with warm westerly winds. The chief species involved

were presumably Starlings, thrushes and Lapwings, for all of which there is an obvious advantage in leaving the Continent whenever the ground is frozen and returning as soon as it has thawed. Vleugel (1948) demonstrated such alternating "frost-flights" and return flights, in that case between NE and SW, for Lapwings in the Netherlands in winter.

Table 2 shows that such an alternation between W and E movements was not restricted to the winter, but occurred throughout the year. In spring, when E departures greatly predominate, there were regular W arrivals with easterly winds. The latter are usually termed "reversed migration", but seem essentially similar to the "hard-weather movements" in the same direction in mid-winter, and these latter in turn grade into the true westward migrations of the autumn. There was also an alternation between W and E movements in June and July; the W arrival is a post-breeding movement of Lapwings, but the species leaving England E at this season are not known. In the autumn, W arrivals greatly predominated, but E departures were not uncommon with westerly winds, including one as late as the night of 24th November, and some of these were perhaps "reversed migrations" of winter visitors from the Continent.

The situation was rather similar for the movements between NNW and SSE and between NNE and SSW. Some of the films for January show "hard-weather movements" slightly west of south out of England and across the Channel with northerly winds, while others show corresponding northward arrivals with southerly winds, sometimes on successive days. In spring, movements NNW and NNE are far more frequent than those SSE and SSW, but at this season there were also some southerly movements with cold northerly winds (and rarely with a SE wind). Conversely, in autumn SSE and SSW movements greatly predominate, but there were a very few NNE and NNW movements with southerly winds, notably one of scale 1 NNW from Belgium across the North Sea to Essex during the first part of the night on 26th September 1961.

This survey suggests that while such terms as the "normal" direction of migration for the time of year, "reversed migration" and "hard-weather movements" are justified by the circumstances in which the movements concerned occur, there is no clear line between them, and that a movement either towards or away from the breeding grounds may occur in any month, the likelihood of its occurrence varying with the time of year and also with the direction of the wind.

COMMENTS ON PARTICULAR DAYS

Some of the most striking movements, as well as representative ones for the time of year, are shown in the twenty-one map-diagrams on

pages 396-402. These are fully explained in the captions which accompany them, but one or two points need emphasis and the following is in the nature of a summary of the situations they illustrate. Where a particular time of day is given in the caption, the diagram represents the situation at that time, but when the time is indicated in more general terms, movements which occurred in the course of an hour or two have been fitted into one picture. Plates 65 and 66 provide photographs of the radar display corresponding with Figs. 2, 5, 16 and 18 respectively.

The first five map-diagrams show "hard-weather movements", southward in Figs. 1, 2 and 4, and westward in Figs. 3, 4 and 5. Figs. 6 and 9 show the three typical movements of spring, namely, E, NNW and NNE, Fig. 7 a concentrated departure from the coast and also birds turning at a front, and Fig. 8 an E departure simultaneous with a southward "reversed migration". Figs. 9 and 10 illustrate a disoriented movement discussed later, Fig. 11 a coasting movement, and Fig. 12 the occurrence of five separate movements on the same spring morning, the two largest being "reversed". Fig. 13, in early June, shows the last pre-breeding movement NNE coinciding with the first post-breeding movement WSW, and Fig. 14 a departure south of east in June, species unknown, with change of direction over the sea. As regards the autumn, Fig. 15 illustrates a change in direction discussed later, Fig. 16 the typical picture in the first part of the night during late August and September, with a very large Passerine departure SSE and small movements of waders west and south-west, Fig. 17 the unidentified eastward movement, and also a reversed movement NNW from Belgium, Fig. 18 westward immigration, presumably of Chaffinches, with change of direction from south of west to north of west, Fig. 19 the three movements typical of September and October mornings, namely SSE over the land and SSW and W over the sea (the last being NW from the Pas de Calais), Fig. 20 big departures E and south in late November, and Fig. 21 a big westward and small SSW immigration which might equally well have been termed hard-weather movements.

HARD-WEATHER MOVEMENTS

The films were particularly revealing of some hard-weather movements in the middle of the winter. A record from 09.00 to 14.30 on 23rd December 1958, when there was a ridge of high pressure over Britain and a light easterly wind, showed, especially after 10.00, a moderate W arrival over the North Sea which, as is usual at this time of the year, reached its highest density after noon. The echoes were large and may well have been from flocks of Lapwings. There was also a small movement just south of south-west in the southern North Sea,

through the Straits of Dover and across the Pas de Calais. Over England itself there was little movement.

The next records were for three days with NNW winds and snow showers from 7th to 9th January 1959, on all of which there was a departure of large echoes with tracks very slightly east of south across eastern and south-eastern England. The radar picture for 7th January, with heavy clouds to the east, is shown in Fig. 1, and that for 9th January, with snow clouds moving rapidly down from the north, in Fig. 2. On 7th January the first birds left the south coast at 11.40 and the migration was densest at 12.30. On 9th January some had already left the Essex coast before 09.00, but on the south coast the first ones left Sussex at 09.30 and Hampshire at 09.45, after which a mass of echoes proceeded across the English Channel to France, the movement being densest around 10.30. During this period, and especially in the late morning and early afternoon, snow-clouds moved rapidly southward over eastern England, and the films gave the impression that the birds were fleeing before them. The large size of the echoes was again typical of Lapwings, and it is possible that, while those on 23rd December had been Continental Lapwings moving west towards Ireland, those on 7th-9th January were British-hatched birds heading for Iberia. Ringing recoveries show that movements of both types occur in the area.

The next radar records show that for six mornings with south-westerly winds between 10th and 23rd January 1959 there were small NNE or, less commonly, NNW movements and there was also a small eastward departure on the 23rd. But on 24th and 25th January the wind was north-westerly and birds departed south, whereas on 26th-28th January, with south-easterly winds, there were very small westward and extremely small NNW movements. This well illustrates how rapidly the "hard-weather" and return movements may alternate at this time of the year.

The last hard-weather movements of 1958-59 occurred with easterly winds from 31st January to 4th February inclusive. There were no southward movements, but on all these mornings there was a W immigration from the Low Countries, the largest of these, on 3rd February, being shown in Fig. 5. This was already in progress at a low density when the radar record started at 06.30. From 08.00 onward, concentrations of echoes left the Pas de Calais, and the same presumably happened from Belgium and southern Holland, but, because the sea crossing is much longer from there, birds were not dense in the southern North Sea off Essex and Suffolk until after 10.00, and the density of arrivals was still increasing there when the record stopped at 11.45.

On the mornings of 5th-9th February 1959 inclusive, in anticyclonic

FIG. 1. *7th January 1959, noon.* Depression over Low Countries, cold with snow showers as indicated by cross-hatching, wind N earlier and in north of area, NW later especially in south of area. Departure of large Lapwing-type echoes S over land, changing to SSE over sea, probably due to drift by wind. First detected inland when thick cloud dispersed between 09.00 and 10.00, first birds crossed Sussex coast at 11.40, highest density 12.30. None detected in east of area, where much cloud remained.

FIG. 2. *9th January 1959, noon.* Depression over North Sea, cold with snow showers as indicated by cross-hatching, NNW wind. Extensive departure of large Lapwing-type echoes just east of south, ahead of snow showers moving south over Norfolk. First birds crossed Sussex coast at 09.30. No change of direction over sea (*cf.* Fig. 1).

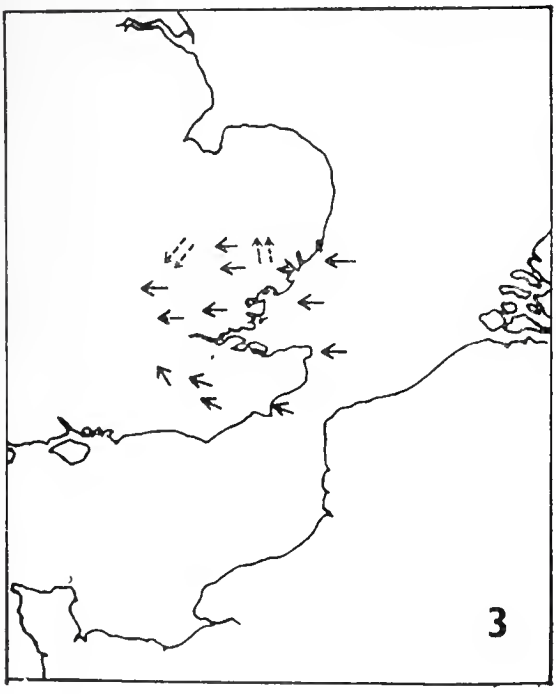
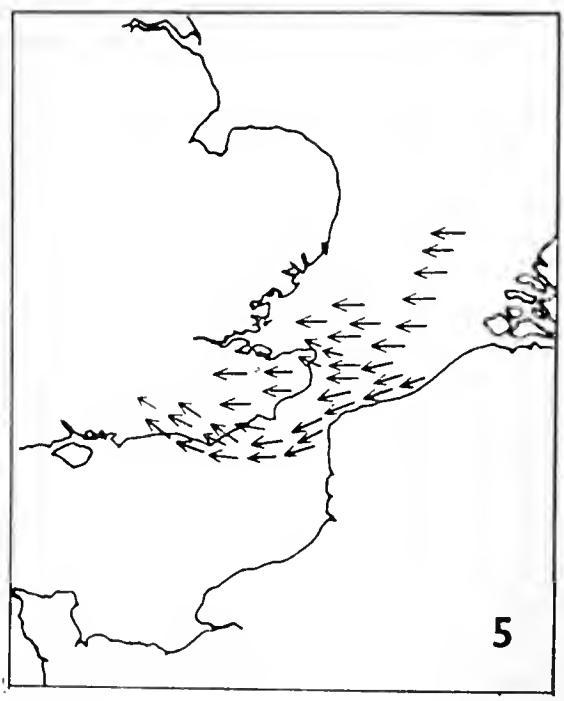


FIG. 3. *13th January 1960, 11.30 hours.* Small depression over Wales, cold with extensive snow showers (not shown), SE wind. Dense arrival from Continent, detected only at close range, indicating low altitude. Main direction W, but WNW from Pas de Calais and over Kent. Local and temporary movements NNW, NW and WSW in East Anglia (and later to west) probably due to birds avoiding snow or possibly to temporary strong gusts.

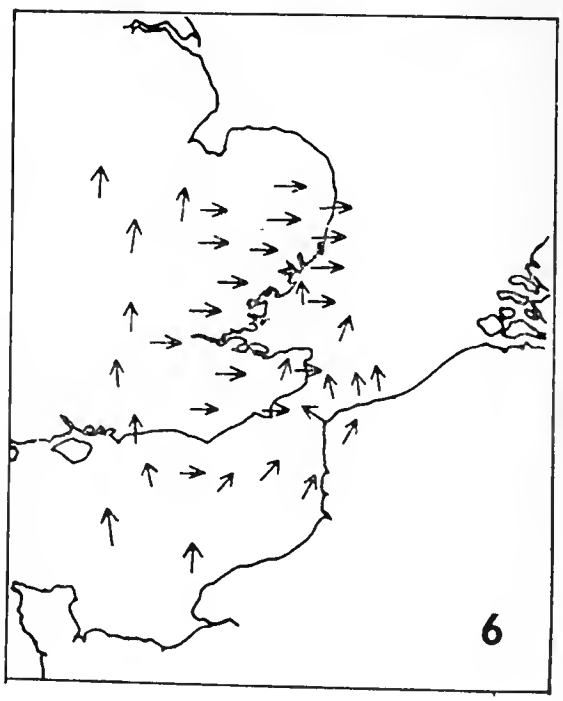
FIG. 4. *13th January 1960, first part of night.* Depression now over Cherbourg, cold, extensive snow-cloud (not shown), wind E changing to NE. W movement greatly reduced over sea, where it stopped



t 22.00, but continuing strongly over and. Dense departure SSW from East nglia, moderate one SSE from north-west. The three movements passed hrough each other in the centre of the rea. All were at short range, indicating w altitude.

IG. 5. *3rd February 1959, 09.00 hours.* nticyclone in North Sea, dry, cold, with sterly wind. Departure W from Con-nent started well before first light, with eak around sunrise. Reached Kent and ussex earlier than Essex or Suffolk ecause of shorter sea-crossing. Birds asted WSW to Cap Gris Nez, where ncentration put out to sea WSW be-ween 08.00 and 09.00, turning gradually in Channel and later WNW, chiefly ter passing Beachy Head, and so in to ad. Later in the morning the WNW rn came further east, so that most rds were flying in over Beachy Head, d yet later over Dungeness. A similar rn WNW was seen off North Foreland, d later in the morning by some of the rds off Essex and Suffolk.

G. 6. *24th February 1960, first part of rning.* Fairly settled weather with ry light southerly wind. The typical cture in early spring: (i) big departure of winter visitors, (ii) moderate arrival NNW of summer visitors, presumably partial migrants, most prominent to west but also north of Calais, and (iii) moderate passage NNE over Pas de Calais, Straits of Dover and Kent. This diagram is compressed somewhat in time since, in the area covered, the departure E occurred earlier than the arrival NNW.



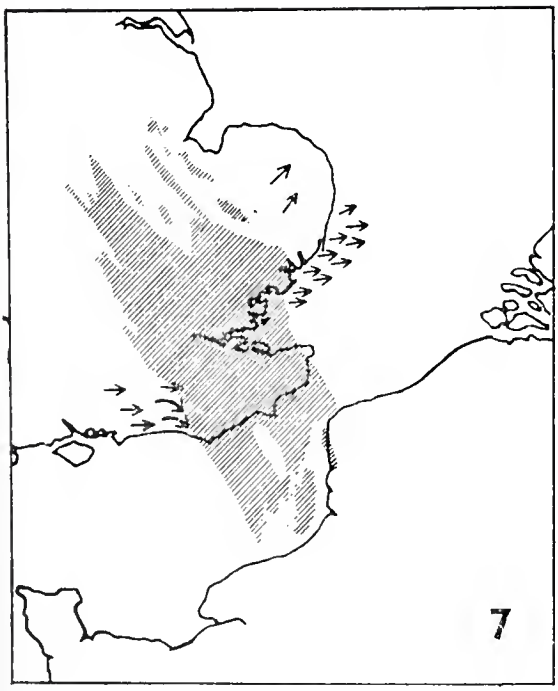


FIG. 7. *11th March 1959, 10.40 hours.* Depression off north-west Ireland, cold front moving north-east over area as indicated by cross-hatching, S wind ahead of front and SW wind behind it. Very small movement north of east in Norfolk and dense departure from Suffolk coast a little north of east, birds presumably flying too low over land to be detected and rising at coast (*cf.* Lack 1960a: 44) or starting from coast after earlier concentration there. No bird-echoes detectable near front, but behind it in Sussex a moderate E movement, some turning SE along edge of front but many disappearing into it.

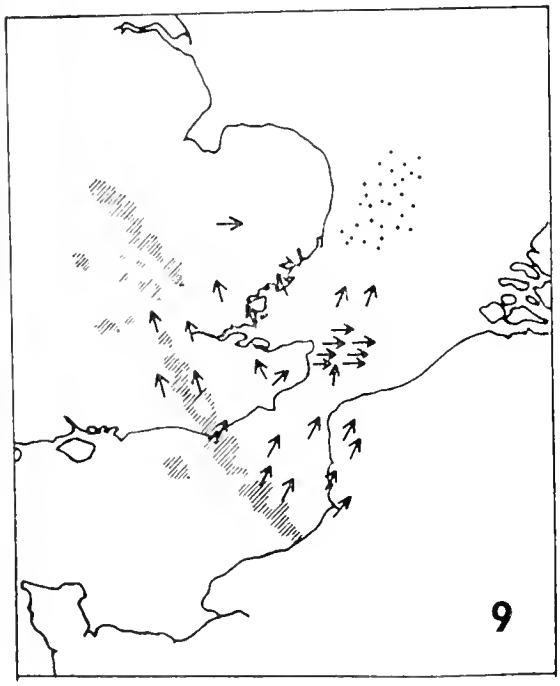
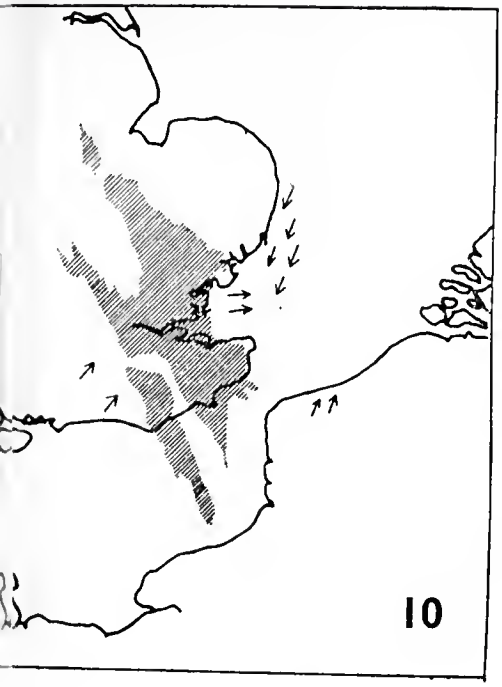


FIG. 8. *22nd March 1960, morning.* Anticyclone over Baltic, SE wind. Big departure slightly north of east, also big movement S, in part over sea to east. A southward "reversed migration" is rare with a southerly component in the wind.

FIGS. 9 and 10. *24th March 1959, 07.00 and 10.30 hours.* Depression to west of Ireland, cold front moving east as indicated by cross-hatching, wind SE ahead of front and SW behind it, widespread fog over northern part of area in early morning. Between 05.30 and 07.30 in south of area there were the three typical spring movements, (i) E, (ii) NNW and (iii) NNE, but in East Anglia extremely few birds were moving E and none in the other directions, presumably because



hey had been grounded by fog. Over he sea off East Anglia there was an rea (shown dotted in Fig. 9) where all irections were random and migrants were presumably disoriented in fog. Movements (i), (ii) and (iii) faded rapidly etween 08.30 and 09.00 as the cold ront moved across, but between 08.30 nd 10.30 there was a movement SSW ver the sea off Suffolk and Essex, presumably due to the birds disoriented arlier returning when the fog dispersed. ehind the front, a NE movement arted at 11.00 and was dense over the hole area in the afternoon.

IG. 11. *1st April 1959, 08.00 hours.* ather disturbed weather with WSW ind. Moderate departure E over land d sea, and marked coasting movement NE to South Foreland and smaller one Dungeness, with concentrated depar-res from these headlands.

G. 12. *20th April 1960, morning.* nticyclone, light NE wind to east, rdly any wind in centre of area and ht wind, NW at surface, to west. ve separate movements, the two main es being "reversed", as typically with E wind, namely arrival W from Holland and departure SSE over land and out to sea from Sussex. At the start there was also an extremely small movement NNE over Norfolk, during most of the time a small movement NNW from the coast north of Calais, and near the end a very small movement E to the west.

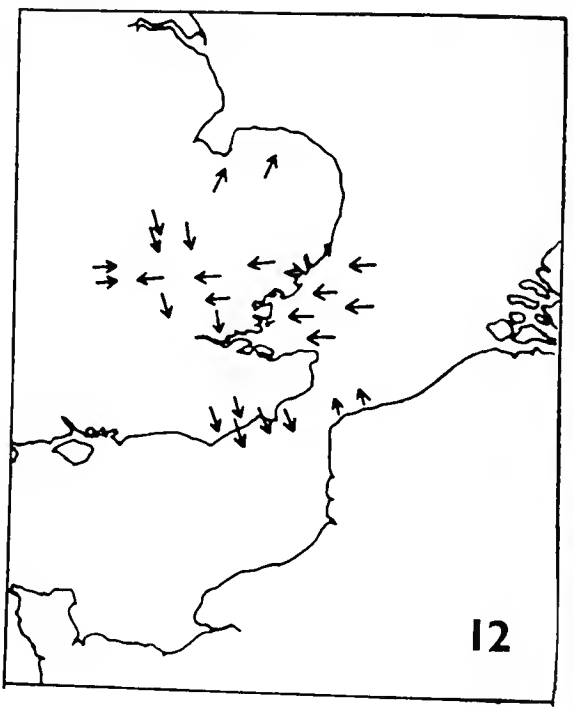


FIG. 13. *3rd June 1960, noon.* Anticyclone with very light NE wind. A small pre-breeding departure NNE over England and Pas de Calais, presumably of aretic species, occurred simultaneously with a moderate post-breeding arrival WSW from the Low Countries, presumably of Lapwings. Also very small movement E in Channel. In Straits of Dover the Lapwings as usual changed from WSW through W to WNW, while the birds moving E turned ENE in Pas de Calais.

FIG. 14. *9th June 1959, morning.* Transitional weather with westerly wind. Departure over land mainly between ESE and SE. Gradual change in direction in southern North Sea between ESE off Suffolk and SSE off Belgium, individual birds changing at different times, so it was hard to be sure what was happening.

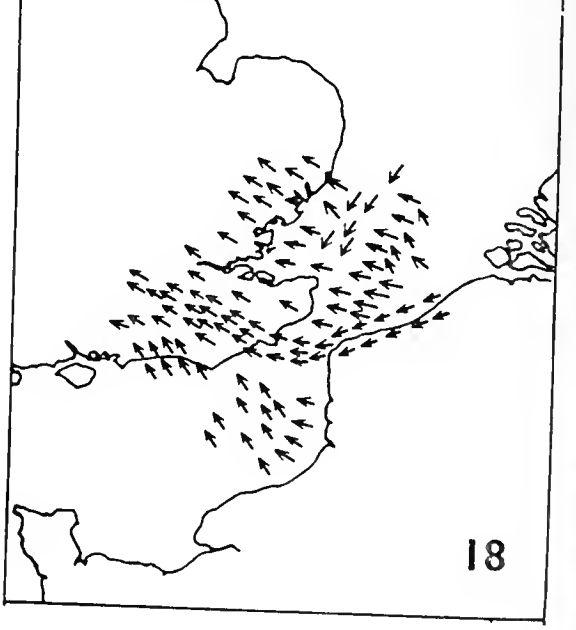
FIG. 15. *21st August 1958, 23.00 hours.* Somewhat disturbed, with light SE wind in southern North Sea. Three small movements of waders and/or gulls. One SSW from Wash had almost ceased by 23.00, another SW over Straits of Dover and Pas de Calais still continued, the third came in west over Norfolk and gradually changed direction from W to SW and eventually S.

FIG. 16. *24th August 1959, 21.00 hours.* Anticyclonic with WNW wind. Between 19.00 and 24.00 a small movement of wader-type echoes SSW across Kent, Sussex and Pas de Calais, some of them coasting WSW to Cap Gris Nez, also a very few SSW over East Anglia. From 20.15 a huge departure of very fine warbler-type echoes over land slightly east of south, the outlines of the Essex and Sussex coasts seeming to advance out

to sea like a wall, as indicated by the dotted lines. Around 23.30 a small W arrival of wader-type echoes. (Also, between 01.00 and 05.00, local disorientation, associated with fog, in Sussex, and no further seaward departures took place from this area during this time.)

FIG. 17. *26th September 1961, early night.* Transitional weather with high pressure to the east, a light south-westerly wind west of East Anglia, a light south-easterly wind in Belgium, and a south wind in between. Small eastward departure (locally SE or ENE) from eastern England, very small movement W from France south of Cap Gris Nez, and small but clear-cut reversed migration NNW from coast between southern Belgium and Pas de Calais.

FIG. 18. *6th October 1959, morning.* Anticyclone in southern Scandinavia, NE wind. Small movement SSW off Suffolk and Essex, presumably from Scandinavia, and dense morning departure westward from Holland and Belgium, presumably mainly of Chaffinches. The presumed Chaffinches in the North Sea flew either W or between WNW and NW, giving the impression of two distinct movements, but probably this was merely due to individual birds making the change from W to north of west at different points on their journey; after reaching East Anglia most flew north of west but some still W. In the eastern Channel and over Sussex, all flew between WNW and NW. In between these two areas a thick band coasted WSW to Cap Gris Nez, and put out to sea as a concentrated stream which gradually changed direction to W and then WNW; this concentration was still easily noticeable far inland over Kent.



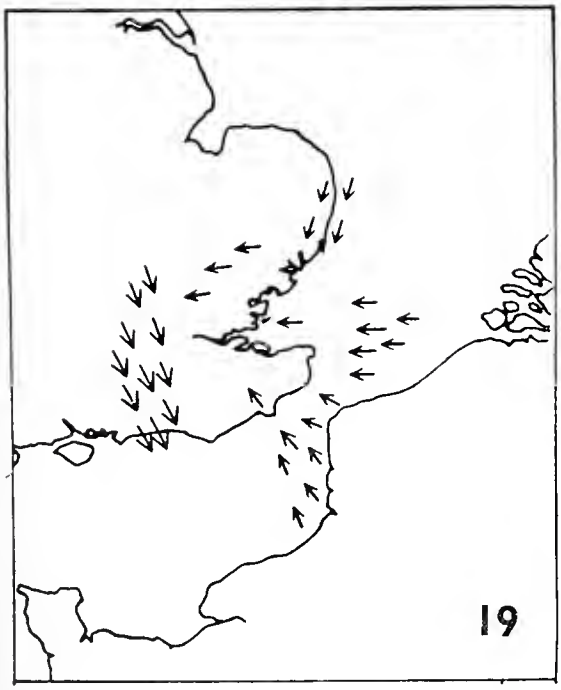


FIG. 19. *13th October 1959, morning.* Anticyclone over Scandinavia and Germany, small depression over north-east England, wind variable but NW to north. This shows the three main autumn movements: (i) departure SSE over land, in this instance chiefly to the west of the station, (ii) small SSW arrival from Scandinavia, and (iii) W arrival from Low Countries, the birds on the last movement as usual proceeding WNW or NW from France south of Cap Gris Nez. In marked contrast to the position in Fig. 18, there was no coasting movement to Cap Gris Nez, and no concentrated departure from it.

FIG. 20. *24th November 1959, early night.* Transitional weather with SW wind. Over England a big departure E and a fairly big departure just east of south, and over Pas de Calais a small movement SW. These movements started at dusk, the one E consisting of moderate-sized echoes similar to those when thrushes are on migration.

FIG. 21. *17th December 1961, mid-afternoon.* Anticyclone centred over Germany, light south-easterly winds. Moderate arrival W into East Anglia, changing direction at east coast from slightly south of west over sea to slightly north of west over land. Also small SSW movement, presumably from Norway, over southern North Sea and Pas de Calais.

weather, very light easterly winds and widespread fog, there was hardly any movement, but what there was came west. The next sizeable movement was NNW with a south-easterly wind on 10th February. There was scarcely any movement during the following four mornings, when fog was again widespread, but with south-westerly winds a moderate eastward departure and a very small NNE movement took place on 15th February, and another moderate eastward departure and a small NNW arrival next day.

The record for the morning of 23rd December 1959 is in marked contrast to that for the same date in 1958 already described, since in 1959, with a south-westerly wind, there was a small northward movement. The next radar records in this second winter were for the period from 15.00 to 17.00 hours on 5th, 6th, 8th and 12th January 1960, during a cold anticyclonic spell with northerly winds. On 5th January with a north-westerly wind, the tracks of the birds were between SSE and S, but on the following evening, with a very light north-westerly wind, the main movement over Norfolk, Suffolk, Essex and the Thames estuary was SSW, though there was a small movement SSE to the north-west of the station, over Huntingdonshire. On 8th January, with a north-easterly wind, there were two movements, SSW over Suffolk, Essex, the adjoining part of the North Sea and Sussex, and SSE to the north-west of the station, over the country around Huntingdonshire. There was also a small W immigration from the sea. On 12th January, with a NNW wind, the whole movement over East Anglia was again SSW, but there was also a small W immigration from the Low Countries, where the wind was easterly.

On the next day, from 10.00 onward, the radar record covered 24 hours. At the start the wind was SE, by 18.00 it was E, and before midnight NE. The hard-weather movements were spectacular. All were detected only at about 40 miles, this unusually short range suggesting that the birds flew low, but within this range the echoes were very dense, so that Figs. 3 and 4, for the morning and evening respectively, do not give a true idea of their impressiveness.

The biggest movement throughout 13th January was a W immigration from the Continent which continued over England. It was already fairly dense at 10.00, increased in density until midday and remained dense throughout the afternoon, but had markedly declined by 19.00. Soon after this there were no further arrivals over the sea, suggesting that it had been a purely diurnal departure from the Continent. But the movement continued fairly strongly over England until 23.00 and at a low density until 04.00, after which it was not detected. In the latter part of this time it was mainly to the west of the station, whereas during the day it had been especially to the east

of it. The main direction over the sea and over East Anglia was due west, but, as is usual with westward immigrations, it was about WNW over the Straits of Dover, Kent and Sussex. In addition, there were a number of remarkable changes in direction locally and temporarily over the land, two of which are indicated by dotted arrows in Fig. 3. At times for half an hour or more over a small part of the land many birds moved NW and once even due north, while in other small areas at other times, and occasionally at the same time, many birds moved WSW or even SW. These were probably avoiding localised snow-showers, and it accords with this view that such movements occurred only during daylight. Alternatively, they might have been birds temporarily disoriented by snow and blown down-wind by strong gusts, but one would then have expected the directions to be more erratic than they were.

Throughout the day on 13th January 1960, the only movement was west (disregarding the local changes in direction). But at 18.00 the first signs were noticed of a second big movement, SSW from Suffolk, which built up rapidly in density between 18.30 and 19.00 and was densest from 21.00 to nearly midnight, after which it declined for several hours, increased rapidly again from 07.00 and stayed high until the end of the record at 09.30. While this movement was densest over Essex, Suffolk and south Norfolk, it also occurred over the Thames estuary and in Sussex. It was not detected over the North Sea to the east of Suffolk and Essex, and if this was not merely because the birds flew too low, the movement presumably originated from East Anglia itself, and was not an arrival from Scandinavia. It seems significant that it started when the south-easterly wind shifted more to the north. Assuming that the movement emanated from East Anglia, it involved both nocturnal and diurnal departures. On the morning of 14th January, it could be seen that the movement continued SSW from Sussex over the English Channel.

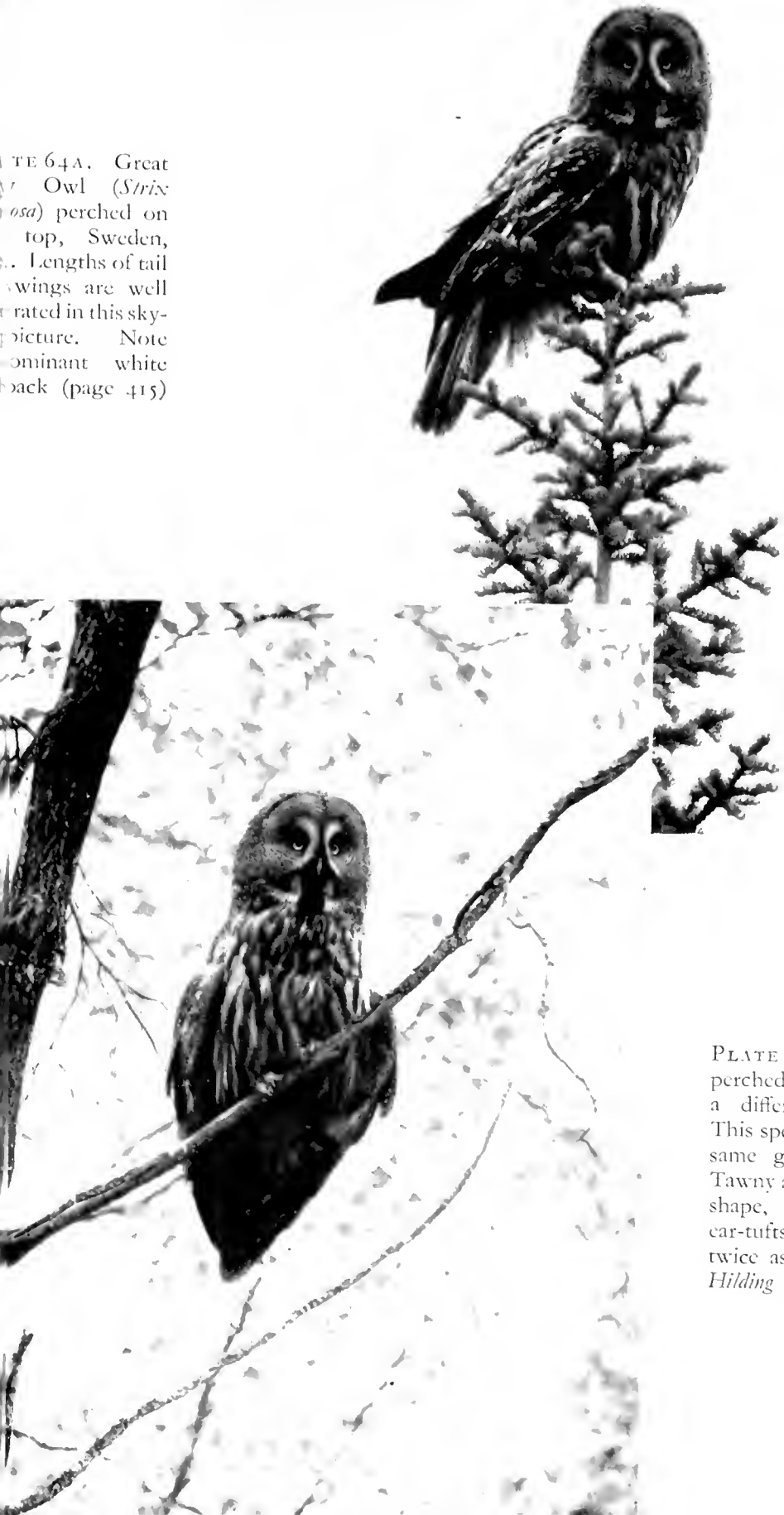
The third movement, with tracks between S and SSE, was always smaller than that SSW, remaining at scale 1 from its first appearance at 23.00 until the end of the record at 09.30. It came, as usual, from the land to the north-west of the station, and its first appearance so late in the night suggests that it may have been a departure at nightfall from much further north in Britain. Part of it came over the station itself and in the morning some of the birds were sufficiently far to the east to cross the Thames estuary.

The next record, for 19th January 1960 with a south-westerly wind, showed a very small NNE movement, but next day, with a north-westerly wind, there was a fairly small southward departure, with tracks SSE, and a smaller departure E. On this day, therefore, a "hard-weather movement" occurred in one direction and a "mild-

PLATES 61 and 62 (*opposite*). Great Grey Owl (*Strix nebulosa*) on wing and perched, Sweden, 1960. Note the massive head with its broad, heavily-lined facial discs and comma-shaped ridges of white between the yellow eyes (which are surprisingly small for an owl); also the black bib, the grey plumage streaked with white and dark, the feathered legs and the whitish patch at the base of the primaries. This owl favours old forests festooned with witch-hair lichen (pages 414-418) (*photos: Göran Hansson*)

PLATE 60 (*overleaf*). Great Grey Owl (*Strix nebulosa*) flying towards the camera, Sweden, 1960. This remarkable photo emphasises the awesome size of the very round head, which may be as much as twenty inches in circumference, and the imposing wing span of five feet; note also the white on the scapulars. Great Grey Owls are quite fearless; climbers to nests may get buffeted (page 418) (*photo: Hilding Mickelsson*)

PLATE 63. Great Grey Owl (*Strix nebulosa*) and young, Sweden, 1960. This photo was taken, without artificial aid, by the light of the midnight sun. These owls do not nest in holes, but use the old nest of some bird of prey; four to six eggs form the normal clutch and a brood of one is rare (page 417) (*photo: Hilding Mickelson*)

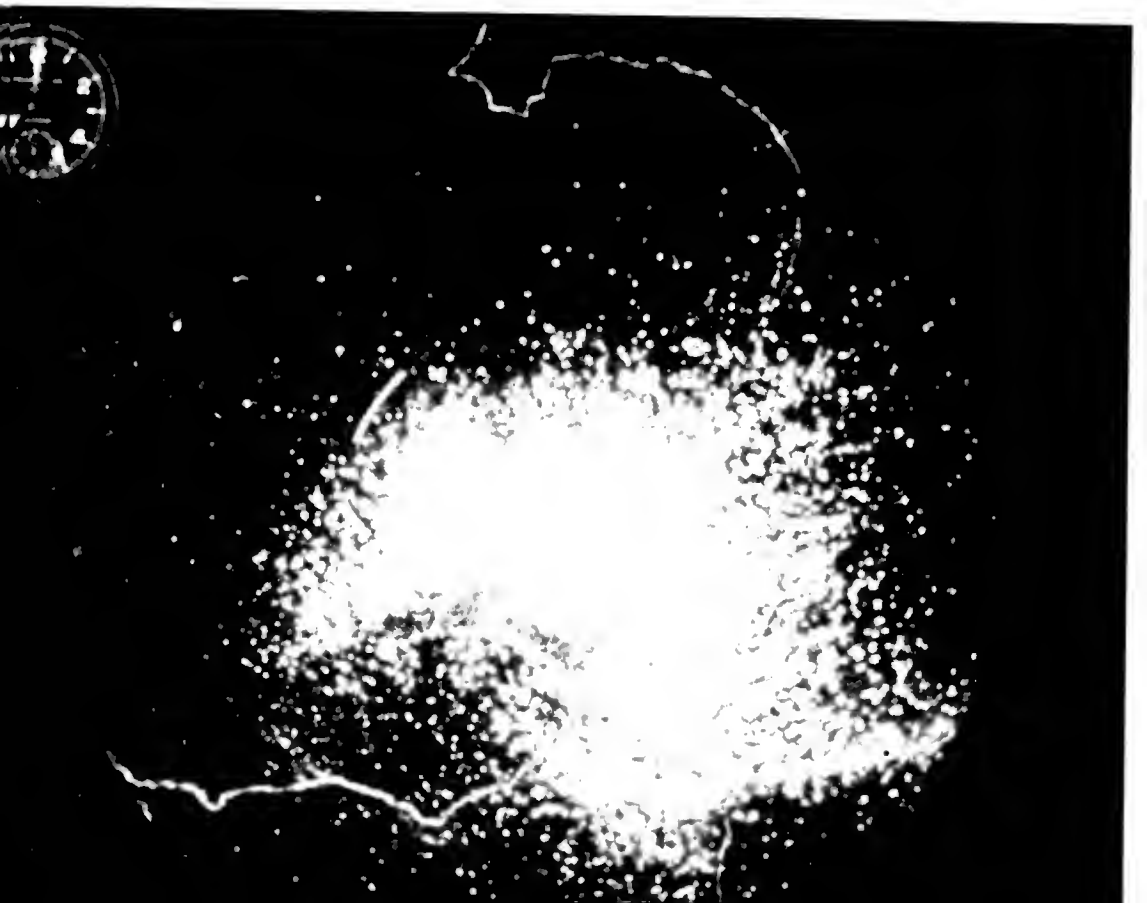


TE 64A. Great
Owl (*Strix*
osa) perched on
top, Sweden,
.. Lengths of tail
wings are well
rated in this sky-
picture. Note
ominant white
back (page 415)

PLATE 64B. Another perched portrait in a different setting. This species is of the same genus as the Tawny and similar in shape, also lacking ear-tufts, but it is twice as big (*photos: Hilding Mickelsson*)

PLATE 65. Radar displays of diurnal hard-weather movements. Above, southward movement over southern England with snow clouds to the north; see Fig. 2 on page 396. Below, westward movement, especially from Cap Gris Nez; (note the after-glow tails) see Fig. 5 on page 397 (*photos: Marconi's Wireless Telegraph Company Limited*)

PLATE 66. Radar displays of departures and arrivals. Above, nocturnal southward departure of summer residents in August; see Fig. 16 on page 421. Below, diurnal arrival of Chaffinches in October, with coasting movement to Cap Gris Nez and on to Kent; see Fig. 18 on page 401 *ante*. (By courtesy of Marconi's Wireless Telegraph Company, Limited.)



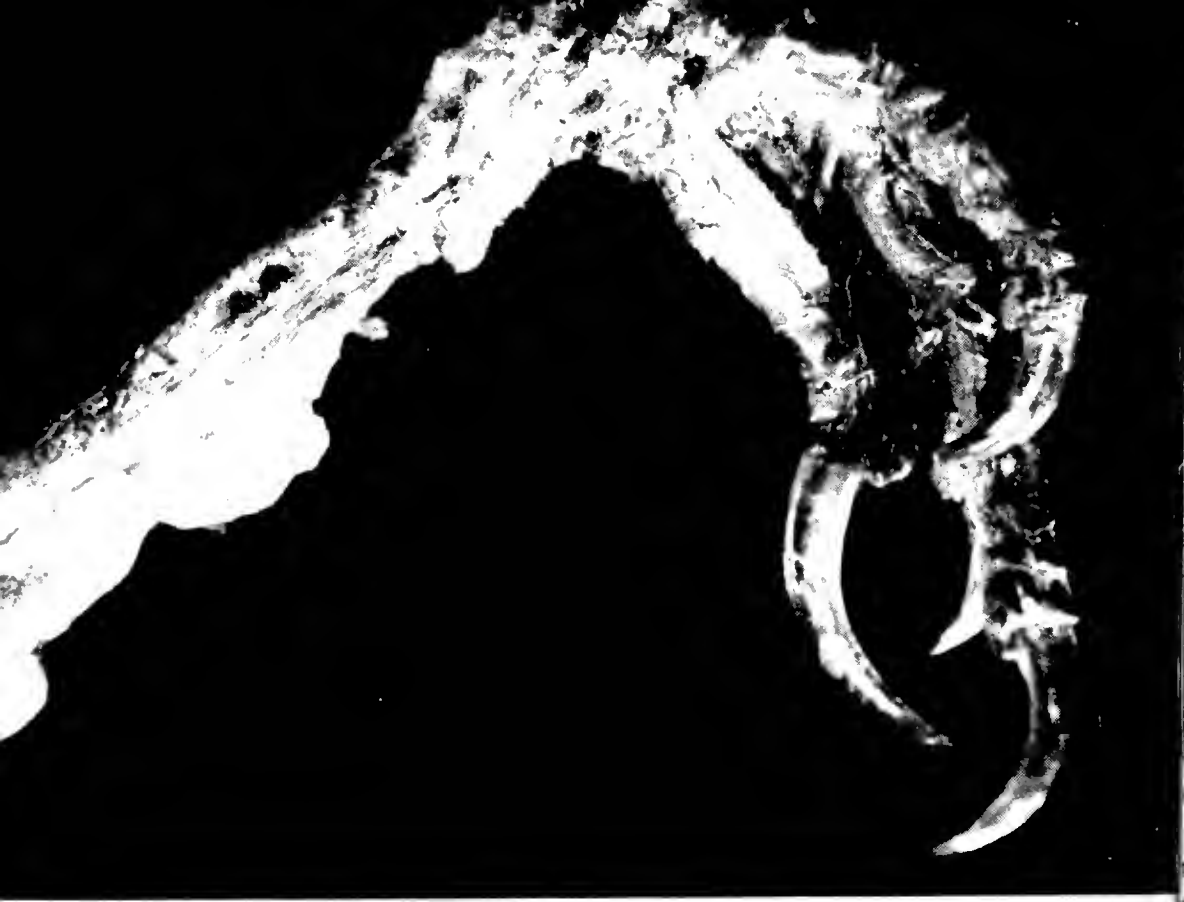
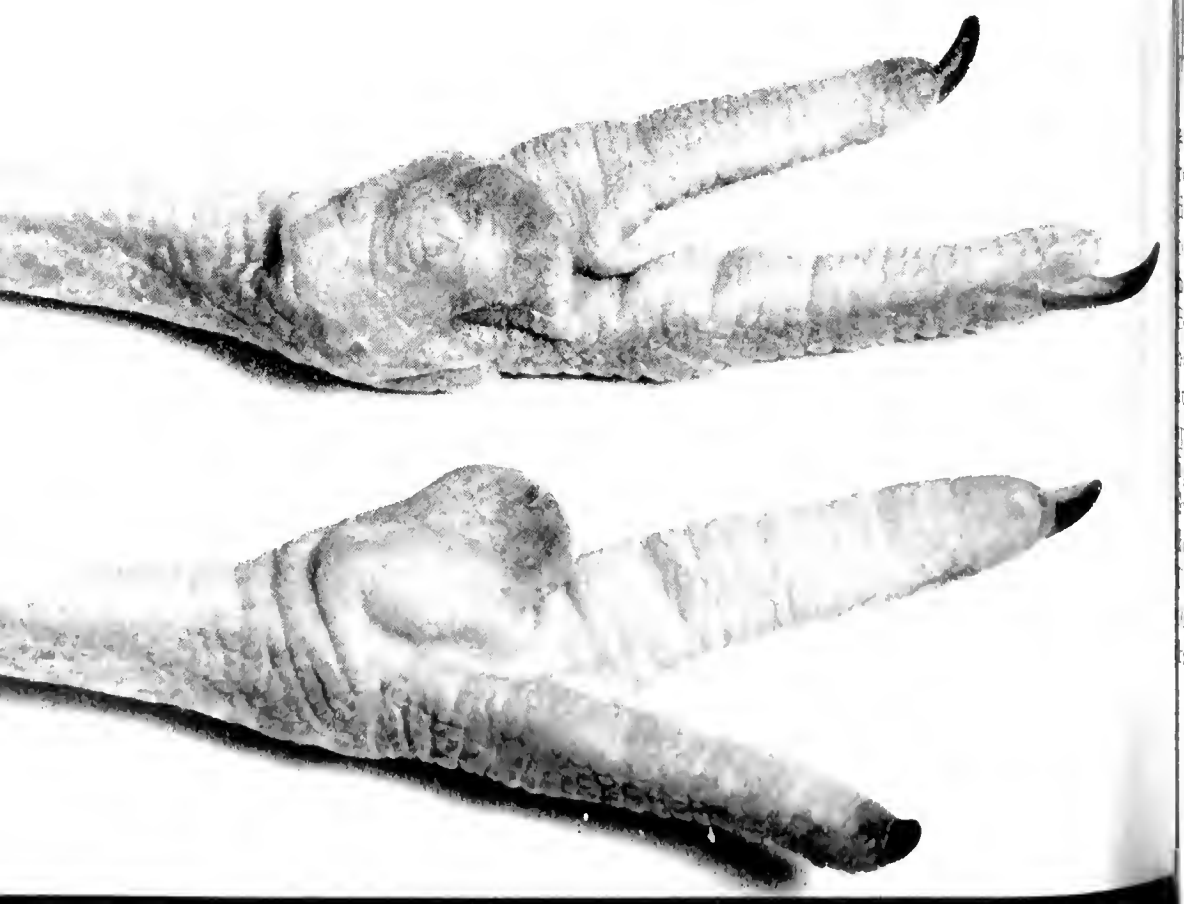


PLATE 67. Above, foot of Chaffinch (*Fringilla coelebs*) with cnemidocoptic mange, a disease similar to "scaly-leg" in poultry, Somerset, June 1961 (page 421) (*photo: R. Hood*). Below, deformed feet of Oystercatcher (*Haematopus ostralegus*) with both the inner toes missing, Flintshire, January 1962 (page 419) (*photo: Ronald Thompson*)



weather" return movement in another. Similarly, with a very light north-westerly wind on 25th January, there was a small hard-weather departure just east of south and a large return movement E, and with a WNW wind on 4th February there was an extremely small southward departure and a moderate one eastward.

No records were made in mid-winter 1960-61, when the weather remained mild. But there were records between 07.00 and 17.00 each day from 14th to 21st December 1961, during a cold dry spell in anticyclonic weather. The W immigrations followed the usual pattern. When the wind was from between SE and NE in the Low Countries, as it was on the four days from 16th to 19th December inclusive, there was a moderately large immigration, the birds heading due west over the sea east of East Anglia, but WNW between the Pas de Calais and south Kent and Sussex, the movement being sparse at 07.00 but increasing rapidly in the late morning and reaching its highest density off East Anglia early in the afternoon. This movement was observed only when the wind in the Low Countries was easterly, except for a small trace with a light northerly wind on 20th December.

The other main movement was of birds heading SSW, chiefly over the North Sea east of East Anglia, but with a small continuation over the land. This movement was densest over the sea from the start of the record at 07.00 until 09.00, but usually continued until 17.00. It was moderately large on 14th and 15th December, small on the 16th, 17th and 18th and negligible thereafter. The birds concerned had presumably set out on the previous night from southern Norway, where the wind was light southerly but temperatures were near to freezing. After the temperature rose there by several degrees, there were negligible further arrivals.

After a very brief milder spell, the weather was again extremely cold and dry from 24th to 28th December 1961 inclusive. The next radar record was from 13.30 to 17.00 on 29th December, when a wave depression just west of Cornwall brought mild south-westerly air over the southern English counties, though from about Norfolk northward it remained cold with NE winds and full overcast. On Boars Hill near Oxford that evening, Skylarks (*Alauda arvensis*) were heard calling excitedly in the fog, as if disoriented on migration, while at intervals in the first part of the night, by which time snow had spread down from the north, one Skylark repeatedly flew up to a lighted window of a house, as if to a lighthouse. D.L. concluded at the time that Skylarks had moved south during the day away from the snow to the north, until they were disoriented by the fog at dusk. The radar record shows clearly, however, that from 13.30 until nearly 15.00 there was a steady arrival NNE across the English Channel and the southern counties up to as far north as Northamptonshire and

Suffolk, also over the Straits of Dover and the North Sea off Essex and Suffolk. There was also a very small movement NNW over Kent and the Thames estuary. These movements ceased before 16.00, and in the next hour all bird-echoes over the Midlands north of about Oxford were disoriented. Most of the echoes were large, probably from Lapwings, but Skylarks presumably behaved in the same way. This is a striking and unusual instance in which the habit of moving north in winter when the wind is southerly brought the birds into severe wintry conditions.

Northerly winds became established over southern England on the following afternoon, when birds presumably moved south, but no further radar records were available until the afternoons of 1st and 2nd January 1962, on both of which there were moderate SSW and small SSE departures, the echoes being detected only at short range, indicating that the birds flew low. On the morning of 3rd January, with a light northerly wind over eastern England, there was another small S.S.W. departure, and also a fairly small W arrival from the Low Countries, where the wind was light easterly.

The remaining records cover 11 mornings and two nights between 8th January and 5th February 1962, and almost throughout this period the wind was south-westerly and the temperature mild. No westward or northward movements were recorded, but E departures took place on nine of the 13 occasions, NNE movements on seven and smaller NNW movements on six.

Summarising these records for three winters, primarily for the daylight hours, "hard-weather movements" occur in three directions over eastern and southern England and the adjacent seas. The most conspicuous arrivals by day come W from the Low Countries, particularly between Suffolk and Kent, with appreciably less into Norfolk; the direction of the southern fringe of the movement, from the Pas de Calais, is WNW not W. This movement is densest at around 09.00 off southern Kent, but at about midday off Essex and Suffolk, where the sea crossing is much longer. The birds continue west over the land by day and night, and most of them presumably reach Ireland. (The records were too sparse to show the extent of nocturnal W departures from the Low Countries, but they do occur.) The second movement is slightly west of south, the main departures from East Anglia itself being in this direction by both night and day, while in one winter there were also SSW arrivals over the North Sea, evidently from Norway. These birds are presumably heading for Iberia. Thirdly, there are small SSE departures, chiefly by night, and chiefly from some part of Britain north-west of Essex. Finally, there are corresponding return movements, respectively E, NNE and NNW.

All six movements are usually of scale 1 or less, but about one-fifth of those W, E and SSW reached scale 2, as did one NNE, while one WW and one E reached scale 3. This is in marked contrast to the spring and autumn, when scale 2 movements are normal and scale 3 ones frequent. As explained elsewhere, the scale on which densities are recorded depends in part on the range at which birds are detected, and hence on the height at which they fly. Part, but only part, of the reason for the low apparent density of these winter movements is that the birds fly lower than in spring or autumn, and some of the southward movements by day were particularly low.

These westward and southward movements are traditionally termed "hard-weather movements", and the term is justified both because they occur in cold not warm weather and also because their function is to bring birds from an area where food is extremely sparse, owing to frost or snow, to an area where it may be more plentiful. Further, it has long been realised that such movements take place only in periods of hard weather, and that in winters without any cold weather the birds concerned do not move out. Finally, as shown by the present records, return movements occur as soon as the weather ameliorates.

This being accepted, however, an important qualification is needed, because the W immigrations from Holland and Belgium were virtually restricted to days with a wind from between NE and SE, and did not occur on days, however cold, with a wind from between NW and N. Likewise, the southward emigrations from East Anglia occurred solely on days and nights with a wind from between NW and NE, and not on occasions, however cold, when the wind was from between E and SE. Since both northerly and easterly winds are cold, both the southward and the westward movements were restricted to hard weather, but during the periods of hard weather each occurred only when the wind was within about 45° of the heading of the birds. Hence neither movement took place in all types of hard weather. These findings suggest that the wind-direction may be used as a "signal" by the birds for setting out, and this is supported by the fact that return northward movements occurred with winds from between E and SW and return eastward movements with winds from between W and NW. This dependence on wind-direction leads, as already described, to the curious situation that, with a north-westerly wind, birds may leave southward on a hard-weather movement at the same time that others move eastward on a return movement. A corresponding phenomenon, though on an extremely small scale, was observed with a south-easterly wind, when some birds moved westward on a hard-weather movement while others returned northward. Once also, on 29th December 1961, the "signal" proved highly mis-

leading, bringing the birds returning northward into an area of heavy snow.

There was one important exception to these findings: birds left southward from southern Norway against a light southerly wind in mid-December 1961. At this time the weather was cold. When it turned warmer hardly any more birds left although the wind was then northerly. This suggests that, at least in this area, temperature itself may also influence southward departures in winter, and that birds may at times leave against the wind when it is cold and the wind is light.

CONCENTRATED DEPARTURES

Coasting movements by day with concentrated departures from headlands are shown in Fig. 11 from South Foreland and in Figs. 13 and 18 from Cap Gris Nez. This phenomenon is now too well known to need discussion, though it is pleasing to confirm it by radar. Much more unusually, for one hour during the first part of the night on 24th February 1959, there was a concentrated line of bird-echoes moving eastward close to the Sussex coast, with a particular concentration where the line ended at Dungeness. There was a light westerly wind and full overcast, so it is conceivable that migrants may have been attracted by the lights of the coastal towns and of Dungeness lighthouse, but this is speculative.

On 16th February and 1st March 1960, during big eastward movements, many Starlings migrated eastward directly from their roosts at sunrise, forming concentrated bands of echoes on the display, and on 1st March they continued well out to sea. At 16.30 on 5th January 1960, just after Starlings had entered their roost in north Kent, a big southward movement began over the land which included a concentration from the area of the roost in question, presumably due to Starlings migrating directly from the roost a few minutes after entering it. More remarkably, on the night of 24th/25th March 1959, when an E departure continued all night, a concentrated group of echoes formed suddenly at 02.45 near Brighton, Sussex, and travelled at nearly 60 m.p.h. over the land slightly north of E, eventually putting out to sea from Kent. A second concentration formed near Dungeness, Kent, at 03.10 and moved in the same direction at a similar speed out to sea. Another west of London was moving in the same direction at 03.45, while further concentrated bands left the Kent coast flying E at about 04.00, 04.30 and 05.20. Between midnight and 06.00, the wind 900 metres above Crawley, Sussex, the nearest recording station, blew from 220° at 24-30 knots, so the air-speed of the birds concerned was probably around 30 knots. This figure, taken in conjunction with the concentrated departures, suggests that the birds may well have been Starlings migrating directly from their

roosts. It was previously known that Starlings may do this at sunrise or just after dark (Eastwood *et al.* 1962), and though it might be supposed less usual for them to leave in the second half of the night, the full moon on the night in question very possibly had some influence. It is hard to suggest any other possible species, and ducks, in particular, can be ruled out because they fly faster and there are no large expanses of open water where they might have collected near Brighton or Dungeness.

DISORIENTED MOVEMENTS

When the films studied here were projected, the bird-echoes normally moved across the screen in one of several directions. Occasionally there was an illusory appearance of randomness when echoes were sparse and moved in different directions, but each held its individual course. This situation, which occurred chiefly in winter with a very light wind and very few echoes, was sometimes hard to distinguish from a disoriented movement, in which the individual echoes changed direction at random. Disorientation was, however, easier to recognise by time-lapse photography than by personal inspection of a radar display as it was going on.

Adding the present records for 11 afternoons to the 279 for the morning or evening, disorientation was recorded on only 22 out of a possible 290 occasions, 3.3% of the 1,463 hours observed. Further, in all save two of the 22 instances, migrants were disoriented in only a small part of the area covered, and when the time for which disorientation occurred was multiplied by the fraction of the area affected, the proportion of disorientation was only between 1% and 2%. Actually the proportion of disoriented migrants was even smaller, since disorientation hardly ever occurred during big movements. It should be remembered, however, that most of the present observations refer to birds over the land, and 71% of them to the hours of daylight. Migrants do not normally start out in full overcast over the land, and when they encounter it there by day they probably tend to alight, or to fly low, orienting by successive landmarks. In fact, of the 17 observed instances of disorientation during daylight, 14 were restricted to birds over the sea, and in the three exceptions the area of disorientation over the land was very small. There were also four instances of disorientation over the land and one over the sea at night. If the present observations had included more at night or more over the sea, disorientation would doubtless have been recorded more frequently.

On every occasion when disorientation was recorded, the British Daily Weather Reports showed that there was fog, total cloud or rain in the affected area. This accords with the usual view that migrants

cannot navigate when sun or stars are obscured. Disorientation occurred at all seasons, and was most frequent in winter, doubtless because full overcast is commonest then. The only instance of widespread disorientation, affecting the whole Thames estuary, and the only instance in which the density of disoriented bird echoes exceeded scale 1, occurred on the morning of 2nd December 1959, when fog was widespread in eastern England. This occurred with a south-westerly wind, so the birds concerned had probably left the land during the night flying east. Another instance when all the observed migrants were disoriented, but the area concerned was not large, occurred on 29th December 1961, as discussed under HARD-WEATHER MOVEMENTS.

Fig. 9, for 24th March 1959, shows that in the early morning the three typical spring movements, E, NNW and NNE, occurred in the southern half of the area covered; but hardly any migration was detected in East Anglia, where the weather report showed that fog was widespread, while off-shore there was a fairly large area in which birds were disoriented (indicated by dots). Between three and four hours later, as shown in Fig. 10, a front moved over the land from the west, nearly all migration over the land stopped, and the fog over the sea evidently dispersed, while from the area where birds had previously been disoriented there was a movement SSW. From the positions of the movements shown in Fig. 9, it seems most likely that the birds that had earlier entered the area of disorientation had previously been travelling NNE, so the subsequent movement SSW was probably a reversed movement of these migrants when they were again able to reorient themselves.

There was a similar incident on the morning of 15th April 1961. During the previous night there had been movements E and NNE over the land and sea, but from 04.00 until 08.00 the birds at sea off Suffolk and Essex were disoriented. Afterwards two movements occurred away from the affected area, one just north of W and the other nearly due S, these presumably being the reversed movements of migrants that had been travelling respectively E and NNE before they became disoriented.

CHANGES IN DIRECTION DURING FLIGHT

The films demonstrated four types of change in direction in daylight at a coastline. First, migrants coming from inland and proceeding out to sea may temporarily follow a coastline if it runs in nearly their standard direction, as shown in Fig. 11. Secondly, in a strong cross-wind, migrants may maintain a heading when following a coastline, or when flying low over the land, but are drifted off-course once they get over the sea, as shown earlier by visual observations on the Starling (Lack 1960, p. 54). A film for the morning of 6th October 1961

showed the same point. Despite a strong SSE wind, some migrants held to the coast WSW from southern Belgium to Cap Gris Nez, but off Cap Gris Nez and off intermediate points along the coast the tracks over the sea were between NW and NNW, presumably being the resultant between a W heading and the strong SSE wind. (Chaffinches or Starlings were probably the species involved. The change in direction at the south coast shown in Fig. 1 may similarly have been due to the migrants concerned being able to correct for drift by the north-westerly wind over the land, but not over the sea. Thirdly, as shown in Fig. 21, birds coming in over the sea a little south of west changed direction to a little north of west after crossing the East Anglian coast; this is regular in autumn in this area. Fourthly, on the morning of 19th October 1961, there was a strong southward movement over the North Sea, but birds coming close to the east coast of Suffolk turned almost at right angles to head in to the land, though once over the land they resumed their southward direction; this also is regular by day. A similar phenomenon was observed in diurnal migrants heading SE from Dungeness, which turned due east to cross the French coast south of Cap Gris Nez on 16th June 1959.

Three types of change in direction in daylight due to bad weather were also recorded. First, occasional reversed movements occurred after disorientation at sea, as discussed under DISORIENTED MOVEMENTS. Secondly, birds probably turned to avoid snow showers, as discussed under HARD-WEATHER MOVEMENTS. Thirdly, and similar to the last, birds migrating eastward over Sussex reached a cold front, where some turned SE along its western edge, while others disappeared, because they either descended or were obscured by rain echoes, as shown in Fig. 7.

More complex changes in direction over the sea were repeatedly observed by day in birds moving westward from Cap Gris Nez towards Kent or Sussex, and there were sometimes corresponding but less striking changes during the same movement elsewhere. A particularly clear instance occurred during the hard-weather movement on 3rd February 1959 shown in Fig. 5. At 08.00 birds coasted WSW to Cap Gris Nez and continued WSW out to sea in a concentrated stream, but by degrees they changed to W and then, mostly when a little west of Beachy Head, to WNW, so that they gradually came in over the land. Individual birds made this turn towards the north at different points, so it was not purely a response to the sight of land. Further, as the morning continued, the average point at which the birds turned from W to WNW shifted gradually further east, so that around 09.30 most crossed the coast near Beachy Head and around 10.00 near Dungeness, while at 10.30, when there was no longer a concentration leaving Cap Gris Nez, the birds moved WNW directly

across the Straits of Dover. On the same morning, birds on the same movement flying over the southern North Sea towards north Kent also turned from W to WNW, which brought some of them more quickly over the Kent coast but meant that others which, had they continued straight on, would have reached North Foreland, turned away from it into the Thames estuary, thus considerably delaying their landfall. Others made a similar turn off the East Anglia coast. The species concerned in this movement are not known, but they may well have been Lapwings.

The same type of behaviour was observed on 19th December 1961, and in particular there was again a progressive eastward shift during the course of the day in the position at which most of the migrants turned towards the north. Between 08.00 and 09.30 the stream leaving Cap Gris Nez came over the land mainly rather west of Beachy Head, but between 09.45 and 12.45 at Beachy Head, and between 13.30 and 16.00 at Dungeness. A turn from WSW to WNW somewhere off Cap Gris Nez was also observed on short films for 4th February 1959, 20th December 1961 and four occasions in June. Lapwings are the only species known to move west in June and are the most likely species to have been concerned in the hard-weather movements also.

A very similar change occurred in the same area on the morning of 6th October 1959, as shown in Fig. 18, in this case involving a much denser movement of much smaller echoes. From the time of year and from visual observations in October, it is reasonably certain that Chaffinches were involved. This was a dense westward movement on a broad front, but it included a concentration moving WSW along the coast to Cap Gris Nez, where many birds put out to sea WSW, turned gradually W in the Straits of Dover and eventually WNW over Kent. The concentration was so great that, despite the many other bird-echoes present, it could be followed as a thick band on the radar display far across Kent. As the morning continued, this band gradually shifted further north in Kent, indicating that the migrants made their northward turn progressively earlier in the course of their flight. Further, the same turn was made by other migrants over the southern North Sea, giving the impression in some areas that two distinct movements might be involved, one W and the other between WNW and NW; but the birds were evidently all part of one movement, different individuals making their turn at different points. This behaviour needs further study, but it suggests that the change in the direction of migrant Chaffinches from WSW in Holland to WNW in southern England is primarily innate, and secondarily influenced by the sight of land, particularly in the Straits of Dover. A similar change in direction off Cap Gris Nez, presumably in Chaffinches, was briefly observed in three other films for mornings in late September

and the first half of October, but not in some other westward movements in this area at this season.

Two other instances of a change in direction when in sight of the coast occurred on consecutive mornings in late January, when birds which were moving NNE through the Straits of Dover turned N, and in some instances NNW, off north Kent. This brought some of them over the land, but took others round the North Foreland into the Thames estuary, so this also was not a simple instance of birds heading in to the land. Likewise, on one morning in February, birds leaving east from Sussex turned north of east near Cap Gris Nez and so made a later landfall than they would otherwise have done. Again, birds on an extremely small movement E in the English Channel on 3rd June 1960 turned ENE near the French coast (see Fig. 13, but the northernmost arrow over France refers to a different movement heading NE); while these turned from E to ENE off the French coast, others coming in the opposite direction turned from W to WNW off the English coast.

All the movements described in the last four paragraphs occurred in daylight among migrants in sight of the coast, and although none of the birds headed directly towards the land, they were presumably influenced by sight of it. The evidence suggests that the migrants in question had a strong tendency to maintain an innate heading or "standard direction", but that they also had a tendency, usually weaker, to head towards the land; the resultant tracks were a compromise between the two. It accords with this view that on four occasions when the movement could be studied over several hours, the birds changed direction progressively sooner after their start as the day continued. This can be interpreted to mean that their tendency to migrate on their innate heading weakened, and their tendency to make the land strengthened, as their urge to migrate declined.

A change in direction of a different nature, of greater extent and probably out of sight of land, occurred on 9th June 1959 and is shown in Fig. 14. From dawn onward birds of unknown species left the Suffolk coast ESE and gradually turned SE, then SSE and finally S as they proceeded across the North Sea, so that they eventually made their landfall in southern Belgium.

Finally, only two instances have been noticed of a change in direction at night, both of them over the land. Once in the first two hours after midnight in late June, migrants moving ENE over the land some miles south of the Wash gradually turned E while crossing Norfolk, and eventually ESE before they put out to sea. Once in the first part of the night in late August, large but relatively slow-moving echoes, perhaps from gulls, came in west over Norfolk and turned very gradually in a great arc over the land until they headed south (Fig. 15).

SUMMARY

(1) The techniques of filming a radar display are described.

(2) The main migratory movements over eastern England proceed between (i) E and W (ii) NNW and SSE (iii) NNE and SSW, and conversely. E and W movements occur in every month, southward movements are commonest in autumn but occasional in spring, northward movements are commonest in spring and rare in autumn. All six movements occur in winter.

(3) Reversed movements in spring, and all types of movements in summer, autumn and winter, normally occurred with a more-or-less following wind.

(4) Hard-weather movements are discussed in detail.

(5) Starlings (*Sturnus vulgaris*) sometimes appear to migrate directly from their roosts, by day or night.

(6) Disoriented movements, normally small, were recorded on 3.3% of the hours watched. Twice there were reversed movements following disorientation at sea.

(7) Birds heading WSW from Cap Gris Nez usually changed direction to WNW in the Straits of Dover or English Channel. At least in the case of the Chaffinch (*Fringilla coelebs*), there was probably a change in innate heading in this area. In addition, the migrants' tendency to fly on an innate heading was probably modified by a tendency to head in to land when in sight of it.

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Studies of less familar birds

119. Great Grey Owl

By H. M. S. Blair

Photographs by Göran Hansson and Hilding Mickelsson

(Plates 60-64)

SOME VERY FINE PHOTOGRAPHS of the Great Grey Owl (*Strix nebulosa*) by Oscar Moberg were published in *British Birds* in 1956 (49: plates 1-3), but the remarkable flight pictures by Hilding Mickelsson and Göran Hansson now reproduced on plates 60 and 61 more than justify the species being included in this series a second time. The notes which follow are intended to supplement the previous text

Brit. Birds, 49: 26-27). All references to the American race are based on Bent (1938).

Great Grey Owls breed throughout northern Eurasia from Scandinavia eastwards, and in the Nearctic region from Alaska to at least the eastern borders of Mackenzie and Alberta. In both hemispheres they penetrate northwards as far as the great forests extend. While the Palearctic race, *lapponica,* has yet to be found nesting outside the Arctic Circle in Fenno-Scandia, in Siberia it does so as far south as latitude 60°. Canada has supplied most of the American breeding-records, one of the few exceptions being from the Yosemite district of California, where these fine owls have been encountered at altitudes of 7,400 and 7,900 feet.

The species cannot be said to breed regularly in any part of its wide range. For as much as a decade nothing will be seen or heard of the birds in a stretch of forest, and then, almost suddenly, they can be reckoned by the dozen. Such invasions often coincide with plagues of Lemmings (*Lemmus lemmus*), but research has shown that these owls resemble Hawk Owls (*Surnia ulula*) and Short-eared Owls (*Asio flammeus*) in depending more on the various northern voles, one or more of which usually swarm at the same time as the Lemming. In Europe Great Grey Owls rarely straggle far beyond the limits of their breeding-range. In some winters, however, southward movements on a quite considerable scale do take place. Such migrants have from time to time reached the southern forests of both Norway and Sweden, but they have been less frequently reported of late, according to Curry-Lindahl (1962) who fears that this interesting species is losing ground in Scandinavia. Winter-flights, sometimes of great strength, have also been recorded from Canada and the northern United States, where this forest-bird has been found "even within city limits".

Though some Great Grey Owls attain a length of thirty inches and a wing-span of five feet, the heaviest amongst them hardly turns the scale at three pounds. Yet, as will be seen from the photographs, these are truly imposing birds with massive heads measuring, in some cases, as much as twenty inches in circumference. The long, loose feathers of the European bird are attractively mottled with brown on a white ground. This predominance of paler colour in the plumage is well shown in the photographs, and serves to distinguish *lapponica* from the darker American race, in which the markings have aptly been described as white on a brown ground. In certain lights the European form can appear even paler than examination of a specimen would suggest. Indeed, I once momentarily mistook the male to be a Snowy Owl (*Nyctea scandiaca*), so pale did he seem as he flew amongst some distant pines under an overcast sky. Other

characters and plumage features are brought out in the captions to the plates.

Eurasian Great Grey Owls favour the stretches of old forest where long witch-hair lichens (plate 61) festoon the pines and spruces. In Fenno-Scandia the habitat always has at least a sprinkling of deciduous trees amongst the conifers, and it will be noted that the background to Hilding Mickelsson's magnificent portrait of a charging bird (plate 60) consists almost entirely of birch. The two nests I visited in Finmark were both on dry, heavily-wooded ridges thickly carpeted with reindeer-moss, and in each case within easy flight of a wide marsh. Canadian haunts are mostly forested with poplar or tamarack. While the Great Grey Owls of the high north live in perpetual daylight for months on end (note that plate 63 was taken by the light of the midnight sun), in Arctic Norway, if not elsewhere, they must still be regarded as primarily nocturnal. On the Pasvik I found that the birds did most of their hunting in the cooler, small hours, and it was only then that they could be heard. The hooting of this species is more musical than, though not so loud as, that of the Tawny Owl (*S. aluco*)—a rather melancholy, far-reaching *hu-hu-huuu*, with the last note the highest and the most prolonged. Another call, most frequently heard when the young are well-grown, is a high-pitched shriek hardly distinguishable from the Tawny Owl's *keewick*. Birds studied by Curry-Lindahl had quite an extensive repertoire, including almost dove-like cooings.

Everyone who has met with the Great Grey Owl remembers it as quite fearless and not a little inquisitive. More than one account speaks of the writer being subjected to a prolonged scrutiny from a perch no more than ten yards away, and that perhaps in mid-winter. A hunting male flew directly towards me on a Pasvik marsh, no doubt attracted by my companion's imitation of a mouse's squeak. It then wheeled slowly overhead, often closing in until the grey and white rings on the facial discs could be counted. Within a few minutes the great bird thrice broke off its circling to glide swiftly down and alight amongst the scrub. The dwarf-birch and *Ledum* always hid it from view, but there was no mistaking the significance of the agonised squeaking that arose each time. One of Curry-Lindahl's correspondents described a hunting Great Grey Owl as flying so low that it looked like a running Hare (*Lepus europaeus*). According to another Swedish observer, these owls often rely on "still-hunting" from a perch.

Great Grey Owls killed in Norway between October and March had eaten wood mice (*Apodemus*), field voles (*Microtus*), bank voles (*Clethrionomys*), Lemmings and, more rarely, shrews (*Sorex*) (Collett and Olsen 1921). Schaanning (1907) identified nothing but Red-

acked Voles (*Clethrionomys rufocanus*) amongst the pellets and refuse round eight nests he visited by the Pasvik in 1903. Even during ole-plagues, however, these owls occasionally kill much larger nimals, such as the Blue Hare (*Lepus timidus*) on which a female I issected had been feeding. There are reports of game-birds—Willow rouse (*Lagopus lagopus*) and Hazel Hen (*Tetrastes bonasia*)—being ken in Sweden and Norway, but such captures do not appear to be ery common. The prey recorded for the American race is more aried, including "rabbits" (presumably *Sylvilagus* and not *Oryctolagus*, ares (*Lepus*), squirrels (*Sciurus*) and birds. One owl had decapitated nd then bolted a fully-grown squirrel; another dropped a partly aten crow (*Corvus*) when disturbed; and a third had clearly dis-overed a roost of Redpolls (*Carduelis flammea*), as its stomach contained ue skulls of no less than thirteen of these little finches.

Schaanning believed one Great Grey Owl's nest he saw to be the ork of the birds—a loose, artless platform of dry twigs, through hich the owlets could be seen from below. Curry-Lindahl referred a similar nest, and there are other, less trustworthy records of these wls building for themselves. Normally they make use of the old me of some raptor—Goshawk (*Accipiter gentilis*), Rough-legged uzzard (*Buteo lagopus*), Red-tailed Hawk (*B. borealis*), Broad-winged awk (*B. platypterus*) or Osprey (*Pandion haliaëtus*). The open nature such a site (compared with the holes or crevices adopted by so any owls) is brought out in plate 63. While some females lay their gs directly on the old lining, many add a top-dressing of pine-edles or bark-strips. The chosen nest may be in a pine, a birch —in America—a poplar; occasionally it is one resting on a tall mp, like the first taken by John Wolley's collectors.

The eggs of the Great Grey Owl vary in length from 49 mm. to mm., and in breadth from 39 mm. to 45 mm., being less rounded an those of the Ural Owl (*S. uralensis*) and the Tawny Owl. They e usually laid in the latter half of April and, if the first nest comes to ief, the bird will sometimes produce a second clutch. Very prolific dividuals have been known to have as many as nine eggs; but it exceptional for a nest to hold more than six. Schaanning found at, while smaller clutches were laid at the rate of an egg a day, as ich as six to twelve days elapsed between the appearance of the rd or fourth egg and its successor in larger clutches. One female kept under observation nevertheless laid her last two eggs in the urse of twenty-four hours. As incubation begins with the first egg, young in a large brood may differ greatly in size and development.

An incubating Great Grey Owl can hardly be overlooked. As Norwegian forester once said, "You would think a man was peering t of the nest". The bird—as far as is known, always the female—

sits very closely. One persisted in brooding her newly-hatched young until I had climbed to within a few feet of her, and even then she did not leave the tree. She was soon joined by her mate, and by the time the nest was reached, the two were perched on either side of it, clattering their mandibles incessantly—a memorable, if somewhat disconcerting, experience. The owners of nests visited by others have varied in their behaviour, the one reaction common to all being the castanet-like beak-snapping. It was Schaanning's experience that when a nest held eggs, the female would swoop past his ears time and again, but he did not report being struck. Curiously enough, he was never mobbed by the parents of a brood of young. Elsewhere these owls have reacted violently to disturbance both before and after the eggs have hatched. Most of the intruders have escaped with a buffeting, often severe enough to inflict painful bruises; but one or two have also received ugly gashes from the bird's claws. There is, of course, always the very real danger of a climber losing his grip and falling.

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Notes

Shelduck moulting in breeding area.—On 9th July 1961, in an area of extensive fresh grazing marshes in north Kent, I noticed an adult male Shelduck (*Tadorna tadorna*) swimming along the edge of a large fleet. The knob on its bill had regressed, but it was otherwise in almost full plumage except that its wings were in an advanced stage of moult, there being only three primary feathers in the left wing and four or five in the right. I approached the bird very closely several times and on each occasion it flapped heavily along the surface, seeking open water rather than the reeds and making no effort to dive. At this date the only other adult Shelduck left in the freshwater sections of this particular breeding area were those tending broods or crèches. The remainder of the summer population had moved to adjacent salt water and the adults had concentrated for the moult

migration. The majority of them, in fact, departed in the course of the next seven days.

Although I was unable to catch and examine this particular bird in the hand, I am quite familiar with the appearance of moulted and moulting wings and I have no doubt about my diagnosis. It has been suggested that the bird might have had some feathers broken off level with the skin by accident or disease, without actually being in moult, but I am sure that there was no question of this. Although one assumes that some wild Shelduck must be overtaken by wing moult before they have left their breeding areas, this appears to have been rarely recorded. However, F. Goethe in his paper on "The moult gatherings and moult migrations of Shelduck in north-west Germany" (*Brit. Birds*, 54: 145-161) does refer to cases of "perplexed moult" by birds which had not reached the Knechtsand area in time.

J. Hori

Oystercatcher with deformed feet.—On 21st January 1962 I found a dead Oystercatcher (*Haematopus ostralegus*) near the River Clywd, Flintshire. It had been shot. The curious feature about it was that it had only two toes on each foot, the innermost ones being vestigial. The feet were photographed by Mr. Ronald Thompson (plate 67b).

Frances Walton

[We showed the photograph to Mr. I. F. Keymer of the Central Veterinary Laboratory of the Ministry of Agriculture, Fisheries and Food, at Weybridge, Surrey, and he has commented as follows: "It is difficult to determine from the photograph whether the protuberances which appear to be mainly on the ventral or plantar surfaces of the feet represent the actual balls of the feet or the bases of the inner toes. Without handling or dissecting the feet a definite diagnosis is not really possible, but in my opinion the protuberances represent the origins of the inner toes. As these digits are absent on both feet, I think that trauma is an unlikely cause, it being difficult to think of a type of injury which would produce a bilateral lesion of this kind. I can also see no definite evidence of scar formation on the right foot. There is a dark area on the apex of the protuberance on the left foot and this could be a scar, but it appears much too small to represent an injury sufficiently severe to have caused such an amputation. The deformities are probably congenital, therefore."—Eds.]

Swift roosting on wall.—At approximately 9.25 p.m. on 29th May 1962, while standing in my garden at Grimsby, Lincolnshire, I noticed a Swift (*Apus apus*) swoop past me and disappear in the shadows of a neighbouring roof. I investigated immediately and was surprised to

find that the bird was clinging to the pebble-dash of the wall directly under the eaves. It was obviously asleep, with its head tucked in its feathers, and it was in exactly the same position two hours later, when I went out with a torch. CHRISTOPHER J. LOWE

[Dr. David Lack described one similar observation of his own in his book *Swifts in a Tower* (1956), but he now tells us that it is actually not uncommon for Swifts to roost in this way, although there are probably extremely few published records.—EDS.]

Beetles in the plumage of birds.—Since the publication of my original note on beetles being found among the feathers of birds (*Brit. Birds,* 54: 115-116) several further instances have come to my notice. All the specimens were collected by T. W. Gladwin in 1961 and all except the last at Rye Meads Sewage Works in Hertfordshire. A Swift (*Apus apus*) trapped on 17th June had one specimen of *Phyllotreta undulata* among its feathers. This is one of the turnip flea-beetles and about 2.5 mm. in length; it belongs to the same family as *Haltica oleracea* which was recorded from a Swift in my earlier note. A House Sparrow (*Passer domesticus*) trapped on 24th June had a specimen of *Coccidula rufa* 2.5 mm. long in its plumage. This is a common beetle by ponds and ditches and it had presumably got on to the bird while it was feeding in some such place. The last two records from Rye Meads both refer to Dunnocks (*Prunella modularis*). On 8th July a specimen of the Staphylinid beetle *Tachinus collaris* 3 mm. in length was taken from beneath the wing of one of these birds; this beetle is normally found in moss. On 24th September a single *Phyllotreta nigripes* was found among the breast feathers of another; this is a plant feeder usually found on the Cruciferae and it belongs to the same family as the species recorded from the Swift.

Meanwhile, on 3rd September, Mr. Gladwin had found a beetle in one of the bags used to transport trapped birds on Fair Isle. This was 2.5 mm. in length and proved to be *Ptinus tectus*, which is normally an inhabitant of granaries. It does not usually occur on Fair Isle and had clearly been carried there by a bird, but it is not known by which species as the bag had been used several times before the beetle was noticed. BRYAN L. SAGE

Bullfinch escaping from cat by "playing dead".—On 23rd March 1958 I saw our cat coming down the lawn of our garden in Oxford, carrying a small bird in its mouth. It dropped it and began to "play" with it, alternately touching it tentatively with its front paw and, when it moved, quickly taking it in its mouth again. The prey was a

male Bullfinch (*Pyrrhula pyrrhula*). The bird fluttered weakly at first and then, after a while, lay completely motionless on its back. The cat gave it two more hesitant pushes with its paw. When the bird did not move the cat started turning away. Just at that moment the bird suddenly flew off. The cat made a quick, grabbing movement after it, but missed it. The Bullfinch flew off in a straight line, landing approximately fifteen yards away in a bush, about ten feet above the ground. The cat did not follow.

This observation strongly suggested that it was the Bullfinch's "playing dead" which made the cat lose interest and which, therefore, may well have saved its life. It would be interesting to know how wild predators would respond in such situations because, if some were even occasionally distracted, this behaviour, which is found in so many small birds, would have definite survival value.

N. TINBERGEN

Chaffinch with cnemidocoptic mange.—The body of a male Chaffinch (*Fringilla coelebs*) was received at the Veterinary Laboratory of the Ministry of Agriculture, Fisheries and Food, at Lasswade, Midlothian, on 14th June 1961. It had been sent from Somerset by Mr. D. Carr of Virginia Water, Surrey. A post-mortem failed to show any evidence of disease apart from raised, thickened, grey crusts on the legs, extending the length of the tarsi (plate 67a). Microscopic examination of the tiny circular openings which gave these lesions the appearance of pumice-stone showed the presence of mites in some numbers. These were submitted to Dr. G. O. Evans of the Zoology Department of the British Museum (Natural History), who provisionally identified them as *Cnemidocoptes mutans*. This mite is the cause of "scaly-leg" in poultry, but the appearance of the lesions was more suggestive of a similar disease in Budgerigars (*Melopsittacus undulatus*). The organism responsible for the latter is the related *Cnemidocoptes pilae*.

The extent and position of the lesions associated with cnemidocoptic mange vary. On the leg they usually start immediately below the feathers and progress to cover the entire tarsus and foot. Similar changes take place at the base of the beak and extend among the feathers of the face. Lesions around the vent are also occasionally seen. The superficial similarity between this condition and that recently ascribed to a fungus infection (*Brit. Birds*, 54: 289-290) could lead to confusion.

J. W. MACDONALD

Review

Identification for Ringers: 2. The Genus Phylloscopus. By Kenneth Williamson. British Trust for Ornithology, Oxford, 1962. 86 pages; 1 colour and 4 monochrome plates. 7s.

There are now about a thousand ringers in Britain. Many of these are trained and licensed mist-netters who have more mobility and ability to trap birds than ever before. Never was it so possible for it to be said, "I saw a rare warbler which I could not identify, so I caught it".

Now that the responsibility for recording the details of a small rare bird in the hand may present itself more frequently, and since this may occur many miles from home, every ringer will be as grateful for this guide as for *Identification for Ringers: 1* which was published in 1960 and covered the genera *Locustella, Lusciniola, Acrocephalus* and *Hippolais*. They are undoubtedly among the most important tools he has ever had. Not only for the identification of species, but also for the determination of race, age and, sometimes, sex, it is a great thing to know what to look for on the spot. And since most of the problem birds are likely to be in the difficult leaf-warbler group, the present guide is most welcome and necessary. Any mist-netter who ventures far into the field without it is falling short of his obligations.

Few ringers can possess a copy of Dr. C. B. Ticehurst's *A Systematic Review of the Genus Phylloscopus* (1938) and they would hardly take the large volume into the field anyway. This new pocket-sized work is Ticehurst up-to-date with a great deal of additional data so thoughtfully arranged as to be really readily accessible. A large amount of material from British and foreign museums has been examined and much live data from bird observatories incorporated. One of the three tables of measurements, of wing and tail lengths of males and females, extends Ticehurst's range of overlap and will properly reduce ringers' confidence in sexing by size. There is a "Key" which seems to work; this might have been still better with page-number references to each bird.

Whilst discussion of the species' origins and distribution is necessarily brief, it is highly informative. Thirty forms are dealt with and 24 of these, the Asiatic group, are classified in an original manner according to primary plumage characters—a useful arrangement for the man in the field. Most of the descriptions include sections on moult and on ageing and these will lessen the number of birds entered on ringing schedules as "full-grown". The age of fully moulted autumn Chiffchaffs (*Ph. collybita*) apparently remains a mystery, however. Incidentally, not all ringers, perhaps, are sufficiently aware

of the effect of wear and moult on wing-formulae and a boldly-stated warning about this might have been expected in the "Introduction".

Many a rare bird has first drawn attention to itself by its voice. In this work, though essentially a guide to the bird in the hand, some vocal aids to identification are stated, shorn of the confusion of detail to be found in *The Handbook*. But, for example, it is doubtful whether "*dschiewist*", if ever we were to hear the noise this is supposed to represent, would help identify *Ph. t. trochiloides*.

The illustrations include a coloured frontispiece of six species by D. I. M. Wallace. These are so good that their only fault is their fewness, though no more value could be expected when so much has been given for so small a price.

More than any other single person, Kenneth Williamson has brought home to ringers the fact that a trapped bird presents greater opportunities than simply that of a ring carrier. His help with the genus *Sylvia*, in the next identification guide, is eagerly awaited.

H. E. Axell

Requests for information

Colour-marked Shags.—Six hundred Shags (*Phalacrocorax aristotelis*) were colour-ringed in England during the summer of 1962. The rings are clearly visible at considerable distances. Anybody seeing one of these birds is asked to note the positions of the colours (and of the metal ring with which each bird is also marked), including whether the rings are on the left, right or both legs. Records should be sent to **Dr. J. C. Coulson, Department of Zoology, Science Laboratories, South Road, Durham.**

Colour-marked Pink-footed Geese and Purple Sandpipers.—A number of Pink-footed Geese (*Anser brachyrhynchus*) and Purple Sandpipers (*Calidris maritima*) were marked with both metal and colour rings on Spitsbergen during the summer of 1962, and some of the latter species were also dyed on the breast and flanks. Anybody seeing one of these birds is asked to make a note of the colour or colours and contact **Thor Larsen, N.O.S.E. 1962, Zoologisk Laboratorium, Universitetet, Blindern, Oslo, Norway.**

Colour-marked Purple Sandpipers.—Over fifty Purple Sandpipers (*Calidris maritima*) have been colour-ringed at Hilbre Island, Cheshire, since 1957. It is intended to mark many more during the forthcoming winter and any observer seeing one of these birds with a British Museum ring on one leg and one or more colour rings on the other is asked to contact **J. C. Gittins, 17 Deva Road, West Kirby, Wirral, Cheshire.**

Colour-marked Oystercatchers.—For the next few years the Fisheries Division of the Ministry of Agriculture, Fisheries and Food will be colour-ringing and dye-marking Oystercatchers (*Haematopus ostralegus*) as part of an investigation into the movements of this species in and around the British Isles. Observers are asked to note precise positions and combinations of colour marks and rings, and to send details to **P. J. Dare, Fisheries Experiment Station, Castle Bank, Conway, Caernarvonshire.**

Feeding habits of Common and Black-headed Gulls.—As part of a detailed study being carried out on the distribution of Common and Black-headed Gulls (*Larus canus* and *ridibundus*), information is required on the feeding areas of these two species from October 1962 to March 1963. Counts of flocks during this period would be most welcome, together with brief descriptions of the feeding area in each case (e.g. sand or mud shore, sewage farm, reservoir, grass, cereal, ploughed field, rubbish tip, etc.) and the time of the observation. If flocks are large, approximate totals of the two species are all that are necessary. However, data on the proportions of immatures to adults would also be useful. Reports and enquiries should be sent to **J. D. R. Vernon, 22 St. David's Road, Thornbury, Bristol.**

FIELD INVESTIGATIONS OF THE B.T.O.

Urban Starling roosts.—Urban roosting by Starlings (*Sturnus vulgaris*) is of comparatively recent origin and the British Trust for Ornithology is launching an enquiry to collect information on seasonal variations in numbers, internal movements within the roosting area, and the present extent and past history of each roost. This enquiry, which will last from October 1962 to September 1963, is being divided into two stages, the first to cover the winter months (October to March) when there are many immigrant Starlings from the Continent, and the second to cover the summer and early autumn (April to September). Helpers will be asked to record the numbers of Starlings present once each month, and to make additional observations in March, April and May on the break-up of the roost. Anyone who could take part or who would like further information is asked to write to **G. R. Potts, Department of Zoology, Science Laboratories, South Road, Durham.**

Inland wintering of gulls.—During the winter of 1952-53 the B.T.O. carried out an enquiry into the inland wintering of gulls and the results were duly published (*Bird Study*, 1: 129-148). The number of gulls inland in winter has continued to increase, however, and so this enquiry is now being repeated after an interval of ten years. It will cover the period from mid-December 1962 to mid-January 1963 and the organiser hopes to collect information on the total size of the population, numbers of individual species, changes in habits and feeding areas, and the histories of any new roosts. Those able to help are asked to contact **R. A. O. Hickling, 44 Swithland Lane, Rothley, Leicestershire.**

Letter

Proposed check-list of Somerset birds

Sirs,—As a preliminary to a possible book on the birds of Somerset, we are planning a distributional check-list for the county. We should be most grateful to hear from any of your readers who have unpublished notes or specimens, or who know of any specimens, collections or game-books relating to Somerset. In particular, we should welcome information about Somerset-killed specimens now in collections or museums outside the county, and any notes, even on the commonest species, for south-east Somerset (e.g. Bruton, Frome, Wincanton) which has been little watched. All correspondence should be sent to Miss Eileen M. Palmer, Highfield, Sandford Hill, Bridgwater, Somerset. EILEEN M. PALMER and DAVID K. BALLANCE

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British Birds publishes material dealing with original observations on the birds of Britain and western Europe, or, where appropriate, on birds of this area as observed in other parts of their range. Except for records of rarities, papers and notes are normally accepted only on condition that the material is not being offered to any other journal. Photographs (glossy prints showing good contrast) and sketches are welcomed. Proofs of all contributions accepted are sent to authors before publication. **After publication 25 separates of papers are sent free to authors (two or more authors of one paper receive 15 copies each); additional copies, for which a charge is made, can be provided if ordered when the proofs are returned.**

Contributors are asked to observe the following points, attention to which saves the waste of much editorial time on trivial alterations:

1. Papers should be typewritten with double spacing, and on one side of the sheet only. Shorter contributions, if not typed, must be clearly written and with similar spacing. Failure to help in this way may result in delays to publication.

2. Notes should be worded as concisely as possible, and drawn up in the form in which they will be printed, with signature in block capitals and the writer's address clearly written on the same sheet. If more than one note is submitted, each should be on a separate sheet, with signature and address repeated. In the case of rarity records, any supporting description which is too detailed for publication should be attached separately.

3. Certain conventions of style and layout are essential to preserve the uniformity of any publication. Authors of papers in particular, especially of those containing systematic lists, reference lists, tables, etc., should consult the ones in this issue as a guide to general presentation. English names of species should have capital initials for each word, except after a hyphen (e.g. Willow Warbler, Black-tailed Godwit), but group terms should not (e.g. warblers, godwits). English names are those used in *The Handbook of British Birds*, with the exception of the changes listed in *British Birds* in January 1953 (46: 2-3). The scientific name of each species should be given (in brackets and underlined) immediately after the first mention of the English name. Subspecific names should not be used except where they are relevant to the discussion. It is sometimes more convenient to list scientific names in an appendix. Dates should take the form "1st January 1962" and no other, except in tables where they may be abbreviated to "1st Jan.", "Jan. 1st", or even "Jan. 1" whichever most suits the layout of the table concerned. It is particularly requested that authors should pay attention to reference lists, which otherwise cause much unnecessary work. These should take the following form:

TUCKER, B. W. (1949): "Species and subspecies: a review for general ornithologists". *Brit. Birds*, 42: 129-134.

WITHERBY, H. F. (1894): *Forest Birds: Their Haunts and Habits*. London. p. 34.

Various other conventions concerning references, including their use in the text, would be noted by consulting examples in this issue.

Tables should be numbered with arabic numerals, and the title typed above in the style used in this issue. The title and any headings within the table should not be underlined, because this sometimes makes it difficult for the editor to indicate the type to be used. It is most important that the layout of each table should be carefully planned with an eye to its final appearance; above all, it should be borne in mind that tables must either fit into the width of a page, or be designed to fit a whole page lengthways. All tables should be self-explanatory.

Figures should be numbered with arabic numerals, and the captions typed on a separate sheet. All line-drawings should be in indian ink on good quality drawing paper (not of an absorbent nature) or, where necessary, on graph paper, but this must be light blue or very pale grey. It is best if maps, graphs, etc., are drawn twice the size of the final reproduction (ideally, therefore, for the normal 4" width the original should be 8" wide); sketches of birds, however, should be only slightly larger than the size at which it is intended they should appear. It is always most important to consider how each drawing will fit into the page. The neat insertion of lettering, numbers, arrows, etc., is perhaps the most difficult part of indian ink drawing and, unless he has had considerable experience of this kind of work, an author should seek the aid of a skilled draughtsman.

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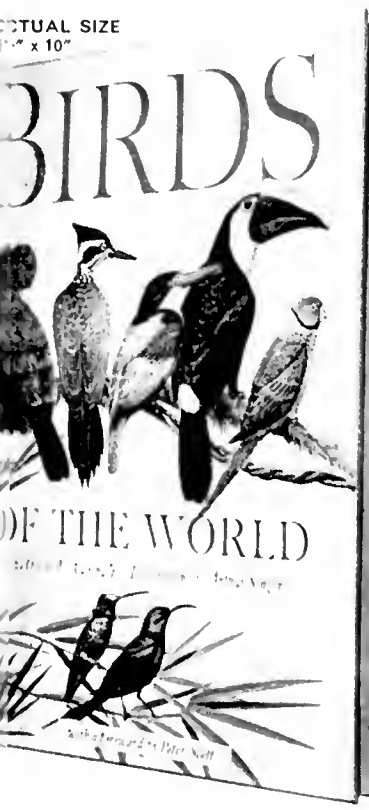

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British Birds

Vol. 55 No. 10

October 1962

Editorial

After Hastings

THE ANALYSIS OF the Hastings Rarities in the August number of *British Birds,* and the publication of the authors' findings and recommendations aroused so much interest that our readers may wish to know some of the things which have happened or come to light since then.

First and foremost, the general conclusions appear to have been wholeheartedly accepted. Many messages and letters of appreciation have been received, from the President of the British Ornithologists' Union downwards. Indeed, so far we have not heard from any ornithologist who is prepared to argue that the Hastings records as a whole can now be regarded as authentic. Several letters on the subject appear on pages 453-459 of this issue.

Such a ready recognition of the realities gives encouraging evidence of the high degree of fair-mindedness, teamwork and united leadership which British ornithology now enjoys. It should perhaps be added here that, before publication, we did of course consult with the Records Committee of the British Ornithologists' Union, in accordance with our established practice whenever the British List is liable to be affected, and all members of that committee agreed with the recommendations in so far as these came within their terms of reference.

The invitation for a case to be prepared for the re-establishment of any individual records considered to be good has received little response so far. Details of about forty records have been submitted and will be re-assessed in due course.

A few readers have regretted the publicity which the report received, and this is something that warrants elaboration. It has even been suggested by one correspondent that the record should have been

quietly set straight "in the process of revising the *B.O.U. Check-List*". But such hole-and-corner methods for dealing with long accepted records would have ensured the worst of all worlds, with incredulity and dissension among ornithologists, demands for the facts, and eventual publication in a highly charged atmosphere. The only alternative to publication was to condone a mass of records we regarded as false.

Given publication, then, it was obvious, in view of the ever-widening interest in ornithological matters and the nature of the report itself, that the exposure would inevitably attract newspaper attention. We felt that to hold a press conference on the eve of publication would give those concerned an opportunity of drawing the attention of responsible journalists to the serious scientific nature of the report and to eliminate many misunderstandings which might otherwise have arisen. This decision was more than justified as it was thus possible to clear up a number of points and to stress the report's concern with the ornithological, rather than the personal, aspects. The result was a balanced, good-humoured and reasonably accurate presentation to the public, and the episode would seem to have enhanced, rather than reduced, the regard in which ornithological standards are held. Apart from the many comments and features in the newspapers and on radio and television, serious reviews appeared in *The New Statesman* and *The New Scientist*.

We also felt that several other issues demanded a wider audience than the readers of *British Birds* and *The Ibis*. These included the possession, by many thousands of people, of books in which the birds affected by the disclosures are actually mentioned and which will now require amendment; the question whether a repetition of such a fraud is adequately provided against; the problem of this journal's share of the responsibility for the original acceptance of the records; and the desirability of reaching all possible sources of further information on the matter.

In the event, the extent and persistence of outside interest has amazed us, put some strain on the running of our affairs, and absolutely convinced us that we were right to give the facts fully and clearly to the press at the outset. Fortunately it is quite plain and generally recognised that such a large-scale deception could not occur now, thanks to the elaborate system of checking and verification which, although at times undoubtedly irksome, must now be seen more vividly than ever to be essential and to merit the universal support which it on the whole commands.

The publicity has brought in some further information, as nothing else could have done. For example, it may be remembered that on pages 316-317 of our analysis we referred to the likelihood of there being "undoubtedly some, perhaps many more" specimens which

were mounted and sold to collectors without any attempt to place them on record. Already a number of such cases are coming to light. In the City Museum and Art Gallery at Birmingham, for instance, there are specimens of Little Ringed Plover, Caspian Plover, Sooty Tern and Isabelline Wheatear which are all from the Hastings Area between 1902 and 1916. None of these was ever recorded anywhere in print, although the Little Ringed Plover would have been the first Kentish record (it antedates by ten years the Lydd specimen of the Indian race discussed on page 309 of the analysis) and the Isabelline Wheatear would have been the fifth British specimen. The label on the Isabelline Wheatear (which is dated a month before the beginning of the correspondence between Bristow and Witherby) states that it was examined in the flesh by W. Ruskin Butterfield; yet Butterfield did not even record it in his "Notes on the local fauna, flora, etc. for the year 1916" in *The Hastings and East Sussex Naturalist*. Another curious point was the discovery that one of the Black Larks (No. 302 in Appendix A) is represented by two different specimens with identical details; one of these is in the City Museum and Art Gallery at Birmingham and the other is in the Boyd Alexander Collection in Cranbrook School Museum. For reasons like these we are now trying to trace the present whereabouts of as many as possible of the Hastings Rarities. At the moment we know where only about two hundred of them are. We hope, therefore, that anyone with knowledge of any Hastings Area specimens of the species listed in Appendix A (whether or not they are already included there) will send particulars to I. J. Ferguson-Lees.

Positively, despite the unfortunate but understandable public emphasis on the elimination from the British List of six species (which constituted a mere 4% of the records concerned), we think that the episode has been helpful in showing the unexpected value of the wealth of present-day records as a means of tracing patterns by statistical methods, which to some extent even pierce the veil of the still unobserved. It may lead towards a more critical and thorough revision of the British List than anything which has yet been attempted, and even enable that List to claim a degree of scientific value in relation to distribution and migration studies, which many critics have hitherto justifiably refused to concede to it. Fresh thinking about the functions and the basis and limitations of the List has been stimulated, and we hope that it will not cease before something constructive has emerged from it. We would welcome any contributions, by way of correspondence for publication or otherwise, towards this end and, having put the Hastings Rarities where they belong, we hope in time to be able to enjoy an opportunity of unfolding a new and more satisfying story belonging not to the past but to the future.

Toxic chemicals and birds: the ecological background to conservation problems

By N. W. Moore

(Plates 69-70)

INTRODUCTION

DURING THE LAST TWENTY YEARS the chemical revolution of agriculture has transformed farming practices throughout much of the world. In Britain its ecological effects are likely to be as important as those of mechanisation, of the Enclosure Acts and of the formation of the Forestry Commission. In recent years only the advent of myxomatosis has caused a comparable public interest in an ecological event.

The problems raised by the widespread use of pesticides are principally ecological and therefore complicated. There is good evidence in many cases that birds have been killed by toxic chemicals (Cramp and Conder 1961; Cramp, Conder and Ash 1962). Observers have also reported a decline in common species coincident with the use of these chemicals. Statements of decreases are generally unsupported by figures, but few would doubt that for large areas of the country, and for such species as Chaffinch (*Fringilla coelebs*), Kestrel (*Falco tinnunculus*) and Sparrowhawk (*Accipiter nisus*), they reflect the actual state of affairs. It is important to know whether toxic chemicals are to blame for the decline and, if so, to what extent. This paper gives a brief review of the background events which must be taken into account in evaluating their significance as an ecological factor in the recent past and in taking practical conservation measures for the future.

Toxic chemicals as a limiting factor

Before considering the ways in which toxic chemicals might affect bird populations, it is necessary to fit their action into a general picture of population limitation; if they do not limit populations they are not ecologically important.

Only a part of the world's surface has a suitable climate for a given species. Within an area of acceptable climate only a limited and generally discontinuous section is a suitable habitat. So climate and habitat, together with geographical isolation which may prevent the colonisation of otherwise suitable places, determine distribution. To a certain extent the area of available habitat controls the numbers of a species. But within the habitat numbers are a reflection of the

alance between the power of increase and the various mortality actors. The approximate upper limit of breeding population density s often determined by territorial behaviour. Toxic chemicals could e limiting factors in two ways—by reducing the area of suitable abitat and by acting as a new mortality factor.

THE PATTERN OF MAJOR HABITAT TYPES IN BRITAIN

ritain was once largely forest, but now (1962) only about 5% of its urface is covered by woodland. About 54% of the land today is gricultural and this is easily the most extensive habitat type. All o little is known about the numbers of birds occurring in different abitats, but from the figures available it seems that farmland is uch richer than moorland in both species and numbers and is quivalent to certain types of woods (Lack 1935, Yapp 1962, J. obbins *in litt.*, N. W. Moore unpublished).

Despite the transition from forest to open conditions, the land bird una of Britain is still essentially a forest one. Of the fifty or so ecies commonly found on farmland, about forty are woodland or rub birds which are wholly dependent—in the absence of woods—n hedges. Those not dependent on hedges are principally the ains species—for example, the Partridge (*Perdix perdix*), Red-legged rtridge (*Alectoris rufa*), Lapwing (*Vanellus vanellus*), Skylark (*Alauda vensis*) and Meadow Pipit (*Anthus pratensis*) and such aquatic birds the Mallard (*Anas platyrhynchos*) and Moorhen (*Gallinula chloropus*). he Corn Bunting (*Emberiza calandra*) requires a song post, but this ed not be a tree or a bush. The House Sparrow (*Passer domesticus*), allow (*Hirundo rustica*), House Martin (*Delichon urbica*) and Jackdaw *orvus monedula*) are to varying degrees dependent on buildings. owever, one must conclude that the hedge is the all-important nithological feature of farmland.

A surprisingly large area of the country is covered by hedges. om very extensive studies in eleven British counties Locke (1962) imated that, excluding urban and suburban districts, there are 6,000 miles of hedge in Great Britain. Taking the average width hedge as two yards this represents an area of about a quarter of a llion acres. In other words, for every hundred acres of crops there nearly an acre of hedge. An acre of hedge supports far more birds, course, than a solid block of scrub of the same area, and these ures emphasise that anything affecting hedges is of major con-quence from the ornithologist's point of view.

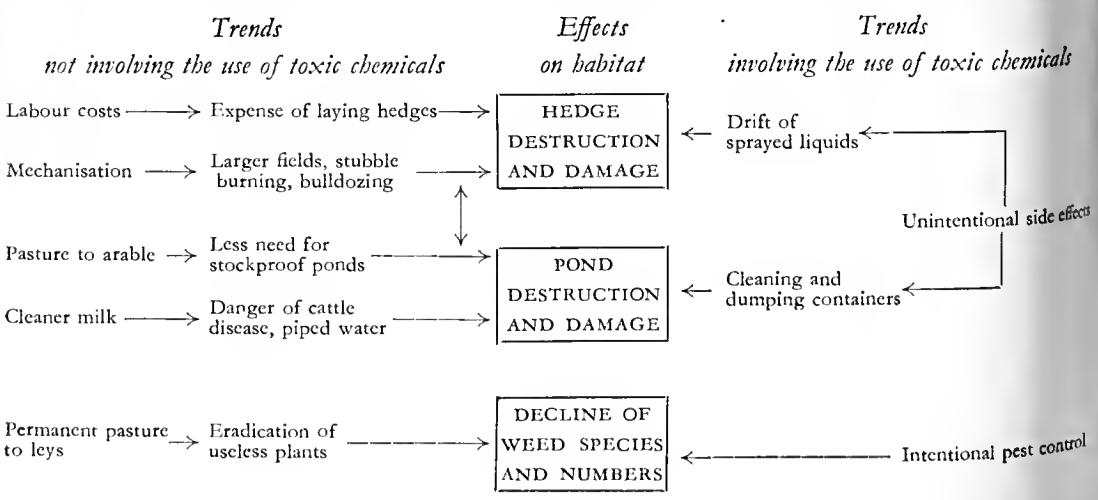
RECENT CHANGES IN AGRICULTURAL HABITATS

e use of toxic chemicals has coincided with, and is a part of, war-e and post-war agricultural prosperity. Present agricultural

trends tend to cause the destruction of wild life habitats. Some of the main trends and their effects on habitat are shown diagrammatically in Table 1 and photographs are reproduced on plates 69-70. It should be noted that in districts where game is preserved many hedges which would otherwise have been destroyed have been retained for the cover they give. A study in progress shows that hedge and pond destruction has occurred on a vast scale in recent years. The extent varies greatly from district to district, but it is especially large in the arable areas of East Anglia and the East Midlands. Preliminary results suggest that between one-tenth and one-fifth of all British hedges have been destroyed in the last twenty years. Similarly, on a mixed farm of about 500 acres in Wiltshire ten out of thirteen of the ponds have been lost during the last 82 years (C. Floyd *in litt.*), and observations elsewhere suggest that this is quite typical of much of lowland England. In some districts, notably in some lowland river valleys such as those of the Thames and the Great Ouse, the loss of ponds has been offset by an increase in water-filled gravel and clay pits. Since 1940 the area of old pasture has been reduced by nearly 30%.

The enormous success of such growth-regulating herbicides as MCPA and 2,4-D in the control of weeds in cereal and other crops has greatly reduced the number, and to some extent the variety, of wild plants; the loss of the plants has, in turn, reduced the insects dependent upon them. Since about a quarter of agricultural Britain is used for cereals, and a further tenth for fruit, vegetables and stock foods (less grass), the total ecological change must be immense. The exact nature of the effects is unknown, but bird populations are likely to have been involved. These changes are inevitable; on the other

Table 1—Some recent parallel trends in British agriculture which affect animal habitats



and, the damaging of hedges by spray drift is an unnecessary misuse nd is against the manufacturers' instructions, which expressly urge perators not to spray on windy days. From observations made in he last two years it seems that drift seldom totally destroys hedges, ut it may significantly affect them as habitats. Similarly, the use of hemicals to control aquatic plants in drainage ditches is sometimes ecessary—though it destroys the habitats of Mallards, Moorhens, eed Warblers (*Acrocephalus scirpaceus*) and other birds—but the ontamination of ponds and streams by washing or dumping the ontainers in them (plate 69a) is quite unjustified; again this is still one despite official and manufacturers' advice.

To conclude this section, toxic chemicals have been the main cause f the great changes in abundance of plant species, while other factors ave been largely responsible for alterations in the gross structural attern of farmland habitats.

RECENT CHANGES IN MORTALITY FACTORS ON FARM LAND

ntil the 19th century the principal mortality factors of birds were sease, predation, starvation and natural accident. Since then, owever, man has introduced a number of new factors, some of which use many deaths. Toxic chemicals are one of these, but the extenve use of wire (for fences and telephone and power lines) and the owth of motor traffic (Finnis 1960, Hodson 1960) must also be entioned. The latter are both similar to predation in that they nerally kill outright. Toxic chemicals, on the other hand, resemble sease and starvation in that, while they may kill, they may equally ell just have harmful, but not necessarily lethal, side-effects. For ample, they may cause a reduction in egg-laying (De Witt 1956) or ake birds more susceptible to disease.

Toxic chemicals have had important local effects—particularly in getable-growing areas in the early 1950's when certain organoosphorus sprays were used on Brussels sprouts on an unusually wide ale, and also when chlorinated hydrocarbon seed-dressings were tensively adopted for the spring sowings of 1959-61. Since the e of toxic chemicals has coincided with an increase in other mortality ctors already mentioned, and since their sub-lethal effects have still be studied in the field, it is not yet possible to assess their relative portance. The situation is further complicated by the post-war rival of game preservation, which favours some species but not ers, and by the introduction of myxomatosis in 1953. Myxomatosis obably harmed predators by reducing the amount of food available, l birds requiring low vegetation—for example, Stone Curlews (*Burus oedicnemus*)—by altering their habitats. On the other hand, some cies may have benefited from the increase in ground vegetation.

Some idea of the likely importance of pesticides can be obtained by considering the broad pattern of their use in Britain today.

GEOGRAPHICAL PATTERN OF PESTICIDE USE

No comprehensive statistics exist to show the present or past use of pesticides. The estimates in Table 2 give only a rough indication of the existing state of affairs. But it is certain that cereals, vegetables and fruit receive more chemicals than other crops and that these crops are concentrated in the east of the country. Therefore, if herbicides are causing a shortage of bird food, one would expect to see the effects most strikingly in the arable regions of East Anglia and other parts of eastern England. Also, if insecticides are having ecologically important effects, one would expect particularly to see these in the same regions and in the fruit-growing districts of Kent and Worcestershire. In fact, most of the seed dressing casualties have been reported from eastern England (Cramp and Conder 1961; Cramp, Conder and Ash 1962) and it is here that the decline in predators and other species has been most apparent. But it must be remembered that loss of habitat has been greatest in this region also.

The pattern that exists today will not remain fixed. Chemical techniques of grass improvement are likely to be used more and more, so that the west of the country may become increasingly sprayed. At present, relatively little spraying is carried out in British forests and woods; however, if chlorinated hydrocarbons were to be used frequently to control insect pests as in the United States or to control voles as in Germany, the effects on wildlife might be as striking here as they have been in those countries. The small size of each spraying operation in Britain favours the rapid recolonisation of damaged areas; if large-scale operations were to become more frequent, for example as a result of improved techniques in aerial spraying, the rate of recolonisation would tend to be slower and so dangers from spraying might increase.

CONCLUSIONS

Toxic chemicals affect both bird habitats and mortality, but they do not act in isolation. So long as other factors continue to destroy habitats and kill birds, observations alone can never determine whether or not toxic chemicals are critical. Even if observations were so extensive that they gave the exact percentage of the total mortality which is due to these chemicals, this information could not provide the answer to the question. The problem can be solved only by experiments in which all factors other than natural ones are controlled. Then, meaningful comparisons can be made between populations in areas where chemicals are not used and populations in areas where

indicated by the symbols (N for North, etc.); where the crop is localised, the name of the district is given in the appropriate geographical area. There is much variation in the percentage of crops treated with pesticides; for example, the figure for sugar beet varies between 10% and 90%, while for peas it is usually about 50%

+occasionally used ++frequently used +++usually used §seed dressing

	Grass	Rough grazing	Cereals	Timber	Vegetables, sugar beet, stock foods	Fruit	
National acreage (millions of acres)	19.9	18.3	7.3	4.0	2.9	0.3	
Principal areas where crops are grown		N	E. Scotland	N	Lancs		North (West Riding, Lancs, northward)
	W	W		W			West (Wales, Welsh border)
	S		Hants, Berks	S	S	S	South (south of Thames)
	M		M		M	Worcs	Midlands
			E	Breck	E	E	East (East Riding, Lincs, East Anglia, Essex)
Percentage of crops treated annually with pesticides	<5%	<1%	80%	<1%	20-60%	90%	

							% of total pesticides used	Persistence	Toxicity to birds
Herbicides (organic growth regulators)	++	+	+++	+	++	+	75-85%	Slight	Slight
Fungicides (organic and inorganic mercury, etc.)			§+++		++	++	5%	High	Slight?
Aphicides (organo-phosphorus)					+++	+++	10-20%	Slight	Very high
Other insecticides (chlorinated hydrocarbons)			§+++	+	++	+++	10-20%	High	High

they are. In both chemically treated areas and in the untreated controls it will be essential to study all mortality factors and their interaction. It may well be that sub-lethal poisoning which reduces clutch size or increases susceptibility to disease over a large area may be much more important ecologically than conspicuous catastrophes due to lethal dosages which wholly destroy local populations. The extensive field studies will have to be supplemented by much laboratory work, in particular by toxicity tests and by tests on changes in egg production caused by different dosages of poison.

Consideration of the complicated practical problems in this field of applied ornithology emphasises how little we know about the limiting of bird populations under any conditions whatever.

SUMMARY

(1) Agricultural land is the most extensive habitat type in Britain and supports a rich bird population at high densities.

(2) The abundance of most farmland species depends on the abundance of hedges.

(3) Pesticides can limit bird populations by affecting their habitats and by acting as a new mortality factor.

(4) Most sprays used today are the relatively non-poisonous and non-persistent herbicides. They have altered habitats by greatly reducing populations of weed species (and, therefore, of the insects dependent on them), and by causing occasional damage to hedges and ponds.

(5) Bird deaths from pesticides have been caused principally by highly toxic and non-persistent organo-phosphorous compounds and by chlorinated hydrocarbons. The latter are toxic and very persistent, and at sub-lethal dosages can affect mortality and reproduction rates.

(6) The increasing use of pesticides has coincided with the widespread destruction of habitats, especially hedges and field ponds, and with the emergence of other new mortality factors, such as increased motor traffic.

(7) The interaction between toxic chemicals and other factors is complicated and their relative importance is not known. It can only be discovered by carrying out large-scale experimental studies in the field on all causes of mortality.

ACKNOWLEDGEMENT

My thanks are due to Dr. H. C. Gough of the National Agricultural Advisory Service for estimates on pesticide use.

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A Black-headed Gull showing both albinism and melanism

By James M. and Jeffery G. Harrison

(Plate 71)

ON 13TH FEBRUARY 1962, an adult male Black-headed Gull (*Larus ridibundus*) in poor condition was found by Dr. R. S. Pitcher at Sittingbourne, Kent. As the bird appeared sick and unable to fly he captured it and kept it in captivity. Immediate examination revealed a compound fracture of the left carpal joint. The bird was later passed to us and survived until 21st February. Post-mortem examination showed no disease, but disclosed a fracture of the tip of the sternum caused by what would appear to have been a No. 1 air-gun pellet, no doubt the same missile which caused the gross disorganisation of the carpal joint.

DESCRIPTION

This specimen falls into the broad category of the symmetrical albesent, for both wings have all the primaries white (plate 71a). They would appear to have been recently replaced, for all show little or no wear and the seventh on the right side has not attained its full length. Not only is this bird a striking albinistic mutant, but it shows in addition some areas of melanism. The bill is of the normal red found in this species and has no increase in the small amount of melanin in the region of the gonys. However, this is not true of the tarsi, toes, webs and nails. These parts show variable melanic patches which are also roughly symmetrically distributed (plate 71b). It is disappointing that the bird did not survive to the acquisition of its summer plumage as we have the impression that the ear-patches and such feathers as have begun to come through on the occipital aspect of the head are black rather than brown.

Sage (1962), in his recent review of British records, was able to cite only two examples of albinism combined with melanism, one a Curlew (*Numenius arquata*) and the other a Blue Tit (*Parus caeruleus*), apart from the occurrence of white primaries in chicks of the melanistic mutant of the Pheasant (*Phasianus colchicus*). However, it is not uncommon in the Mallard (*Anas platyrhynchos*) and some other species of the Anatidae, among adults as well as young, as we have recently shown (Harrison and Harrison 1961, 1962).

DISCUSSION

While, of course, no experienced ornithologist would have been deceived into believing that this bird was an example of the Mediterranean Black-headed Gull (*Larus melanocephalus*), particularly if it was seen under favourable conditions of light and range, one must nevertheless question what field identification might have been arrived at in other circumstances. The problem would have been increased if the bird had attained summer plumage with melanism of the hood.

The tendency of birds to exhibit symmetrical wing albinism should be borne in mind when the determination of a rare species in the field rests upon this particular character.

ACKNOWLEDGEMENTS

We are most grateful to Dr. R. S. Pitcher for presenting us with this bird in life, and to Dr. Pamela Harrison for the photographs.

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[Apart from the interest of albinism and melanism being combined in one individual, this case is a useful warning of the deceptive effects of plumage abnormalities. Albino Black-headed Gulls and Common Gulls (*L. canus*) are still occasionally reported as Ivory Gulls (*Pagophila eburnea*) and now we find a condition which might well have resulted in the hasty identification of a Mediterranean Black-headed Gull. —Eds.]

Special Review

By J. B. Cragg

Animal Dispersion in Relation to Social Behaviour. By V. C. Wynne-Edwards. Oliver & Boyd, Edinburgh and London, 1962. 653 pages; 4 colour and 7 monochrome plates; 50 text-figures. 55s.

This is a book about the regulation of animal numbers, although this is not obvious from its title. Most zoologists with this subject as their main theme would have started with references to V. Volterra, A. J. Nicholson, W. R. Thompson, H. S. Smith and others. It is indicative of Prof. Wynne-Edwards's originality of outlook that the last two names are not mentioned, nor for that matter are those of A. Milne and M. E. Solomon, and, apart from a brief reference to A. J. Nicholson on page 9, some two-thirds of the book go by before he and Volterra really make their appearance.

The author, whilst not rejecting the usual considerations associated with the interplay of density-dependent and density-independent factors, has concerned himself with the capacity of populations to regulate their densities so that they do not over-exploit the resources, particularly the food-resources, of their habitats. The term *population homeostasis* has been coined to cover these aspects of population dynamics. In physiology, *homeostasis* was first used some thirty years ago to describe the maintenance of steady states within an organism by what we would now describe as feed-back mechanisms. The organism received information about what was happening and then made suitable adjustments. On this basis, population homeostasis requires the "feeding-in" of information about the state of the population and of the resources available to it. The population then adjusts its numbers accordingly. This obviously implies that the population or group must be the operational unit; the author, accepting this, argues that the phenomena of social behaviour constitute the mechanisms whereby population homeostasis is attained . . . and thus his title becomes meaningful.

Perhaps the reviewer should state his own position regarding this hypothesis. I am on Wynne-Edwards's side. I look upon population homeostasis as a product of the evolutionary process whereby organisms have made themselves as independent as possible of fluctuations in their environments. I look upon it as a development equivalent in kind to, but in a sense more important than, that of body-temperature control in birds and mammals and that of ionic

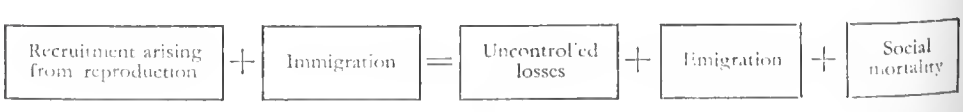
and osmotic regulation which occurs in a wide range of organisms. Its degree of development can be expected to vary from species to species, reaching its greatest complexity in the most highly evolved groups.

Much of the author's argument must depend on the interpretation of circumstantial evidence. In some ways the book is reminiscent of *The Origin of Species*. There is the underlying hypothesis and the massive collection of facts to support it. As Paley saw the hands of the Creator everywhere and Darwin saw natural selection, so Wynne-Edwards sees population homeostasis based on social integration. The features of colonial life, migration, peck-orders, sexual selection, communal roosting, phases in insects, vertical migrations of plankton and mimicry are among the many phenomena explained by the author in terms of his hypothesis.

Population homeostasis implies that animals must be good conservationists. What is required is selection operating in such a way that groups of populations can control their own densities, keeping them at a level which is as near as possible to the optimum which the habitat can support. Wynne-Edwards's use of the word *population* will no doubt raise criticisms, but his definition is certainly no worse than many others. To him and within this review the word means a group which is, to a considerable degree, isolated from other groups of the same species, not necessarily by geographical or ecological boundaries but by social characteristics.

About one-fifth of the book is taken up with a broad review of the methods of communication which exist within the animal kingdom. These pages are worth reading for their zoological content alone, apart from their bearing on the author's hypothesis. In fact, looked at solely in terms of the purpose of the book, this part of the case could have been shortened considerably. From his review, Wynne-Edwards concludes that animals cannot be clearly divided into "social" and "non-social" types; instead, social integration in some degree is probably a universal feature of animal matter. Needless to say, when we move outside birds, mammals and insects, some of the evidence is rather thin. I was intrigued, but not unduly impressed, by his reference to the two thousand harvest-spiders with legs interlocked "possibly" as a method of transmitting stimuli from one part of the "colony" to another.

In simple language, population stability is achieved when recruitment is balanced by losses and Wynne-Edwards sets out these requirements as an equation:



Apart from the chance mortality factors which will account for "uncontrolled losses" in all populations, the other components in the author's equation can be influenced by social phenomena. Group pressures, for example, may bring about the emigration of some individuals. Recruitment from reproduction has received considerable attention and the evidence for this being density-dependent is fully substantiated for many organisms. Wynne-Edwards's insistence on the importance of limiting recruitment to the breeding population clarifies, I think, some of the difficulties which have muddled our thinking about the regulation of animal numbers. An obvious case is the large number of non-breeding individuals in sea-bird colonies; these constitute a strategic reserve, available if necessary to fill in any gaps which may occur within the breeding population.

It is fundamental to the population homeostasis hypothesis that restraints must be built into the genetic constitution of a species. The usual argument against this is that selection will favour the individual capable of producing the largest number of viable offspring. As long as we concentrate on the individual this might appear to hold, but survival of the species is dependent on the survival of the population of which the individual is a part, and the successful groups will be those which maintain a gene constitution that favours group survival. In this connection it is worth while pointing out that W. Z. Liddacker (*Amer. Nat.*, 96 (1962): 29-33) has produced arguments supporting the view that a density-responsive type of emigratory drive could confer advantages on a population.

The development of caste systems, of different sizes of young and of peck-orders, are efficient ways of ensuring that socially-induced mortality can be brought into action when necessary. All these and other forms of hierarchies are, according to the author, methods of distinguishing between the *haves* and the *have-nots*. These ensure that, in times of shortage, those groups lowest in the scale are the first to suffer, particularly if food is scarce. By these means the higher social categories may not experience any limitations and, when conditions improve, they are in a position to bring the group back to its normal size.

The author's discussions of territory, colonial nesting and communal roosting, to mention only three topics, should prove of great interest to ornithologists. He argues that the difficulties experienced in understanding territory have largely arisen because territory has been considered as an isolated phenomenon. To the author, territory represents a system of land-tenure or resources-tenure, and territorial behaviour and colonial nesting become two aspects of the same general phenomenon, the husbanding of resources, particularly food supplies. In a colony of sea-birds, whilst the feeding area is shared by

all members, within the colony the numbers are limited by nest territories. The colony itself maintains its distinctiveness from other colonies and the establishment of breeding sites beyond the limits of the traditional colony takes place very slowly, if at all. Individuals contesting territorial claims, and this applies generally, are provided with information on local densities. The same information can come from other sources and the author cites communal pre-nuptial displays, such as leks in some birds and mammals and the phenomena of swarming in many marine invertebrates and in insects.

In his consideration of communal roosting, the author again turns his back on accepted explanations. To him the roosting habit, which occurs in a wide range of animals from insects to mammals, is a means whereby information on densities is acquired, and where food-shortages may lead to "socially-induced mortality". In a sense, the roost serves a function similar to that of a breeding colony. In roosts, colonies, feeding flocks and so on, displays often of a visual or auditory type usually occur. These performances, the *epideictic displays* to use the author's terminology, provide the information necessary for bringing about adjustments in relation to resources.

Within the limits of a review of this size, it is difficult to avoid emphasising certain features of the author's case for homeostasis. Perhaps too much emphasis has been laid here on the steady-state aspects of population homeostasis. The author is not guilty on that score. It is fundamental to his conception of population homeostasis that the reactions of the population must be sufficiently elastic to allow it to exploit surplus or new resources when they become available. It is a common feature of physiological control mechanisms that brake and accelerator seem to be in action at the same time, and this also applies in population regulation. On the one hand you have the conservation of the population arising from the restraints built into its genetic make-up, on the other you have the explorer element which will allow the population to expand and utilise the new resources. The explorer element will only succeed in unusual circumstances and it must not form too large a proportion of the population; otherwise the social cohesion of the population will be in danger of breaking up. This dilemma has its analogy in low mutation rates which allow sufficient change to test new effects without upsetting the normal stable gene complex.

With this aspect of the population problem in mind, it is worthwhile examining Wynne-Edwards's treatment of organisms which have shown tremendous changes in their numbers. There are many cases where changes in the amount of available food are so unpredictable that homeostatic mechanisms could not operate effectively. The build-up of the migratory phase in locusts can be looked upon as a

special adaptation to cope with a variable habitat. It is of interest to note that T. R. E. Southwood (*Biol. Rev.*, 37 (1962): 171-214) has concluded, from a survey of migration in terrestrial arthropods, that the level of migratory movement is positively correlated with the degree of impermanence of the habitat.

Whilst conservatism seems to be the rule among sea-birds, there are apparent exceptions and the author considers the Herring Gull (*Larus argentatus*) and Fulmar (*Fulmarus glacialis*) in some detail because they appear to have departed from the accepted homeostatic pattern. Do they represent cases where regulation mechanisms have broken down or are they examples of species exploiting new resources? Wynne-Edwards is of the opinion that the Herring Gull is exploiting new resources and that changes in its numbers ". . . are legitimate and most likely still under homeostatic control". As for the Fulmar, the author does not accept James Fisher's explanation that its spread can be correlated with the expansion of the whaling and fishing industries. In his analysis of the case, Wynne-Edwards has failed to find a satisfactory correlation between the two. Of particular importance is the fact that no colony appeared between Aberdeen and Grimsby until the 1920's, in spite of the tremendous concentration of fishing activities in the seas off that coast. On balance, Wynne-Edwards favours the view that the spread of the Fulmar takes its origin from the production, in all probability in the Westmann Islands, of a new genotype.

One of the delightful features of this book is the wide-ranging, comparative approach of the author who is obviously at home with most groups of organisms. Man, quite justifiably, comes within Wynne-Edwards's zoological kingdom and, whereas Darwin in *The Origin of Species* was content to mention man only on the penultimate page, man enters this book in the preface and stays right through to the end. I have no wish to minimise the seriousness of the world population problem (and here I feel relieved that I can use *population* in its classical sense). I think, however, that in his references to man the author often overstates his case and the data quoted lack a sense of depth. Thus, in his preface, he asserts that "The evident loss by man, almost within the historic period of the means of limiting population growth, which he formerly possessed like other animals, stands out with disturbing clarity". By these words, from being an hypothesis, population homeostasis becomes an established principle and the loss of that principle in man is given a date. If we are prepared to assume that man did possess social mechanisms to control his numbers, and the evidence for such a view is quite strongly held, the limits of growth were laid down by the available resources and by the speed at which new resources could be colonised and developed. The active units are now larger and their capacity for movement

considerable. Admittedly, if homeostatic mechanisms have to operate on a global scale the margin for error is certainly not great. One aspect of the author's references to man deserves special mention. With nineteen of his twenty-three chapters completed, Wynne-Edwards re-read A. M. Carr-Saunders's *The Population Problem* (1922) and discovered, to quote his own words, "so many of my own conclusions anticipated". Carr-Saunders's principle of the optimum number for primitive human populations assumes the operation of homeostatic mechanisms based on group behaviour on the lines which Wynne-Edwards has propounded.

The general effect of this book is to leave the reader (certainly this reviewer) in a pleasant state of mental indigestion. The range of information brought together by the author warrants one word, encyclopaedic. The question remains, however, has he established his hypothesis as a theory, or, better still, as a principle? The case seems overwhelming whilst the facts are before one, but away from the book doubts arise. He has certainly produced an hypothesis which, given the assumption that social integration is a common property of most animal species, allows one to offer a common explanation for a wide range of phenomena which have not previously been considered as related to each other. Now that this book exists, studies on the regulation of animal numbers can never be quite the same again. The mathematical approaches of the last decade, and the controversies which have centred around the interpretation of the rôle of density-dependent and density-independent factors, have without doubt given both form and purpose to much ecological work. Now, however, Prof. Wynne-Edwards has thrust the study of population regulation back into the world of biology. It has, in the process, become much more complex, but at least he has exposed innumerable points at which the hypothesis of population homeostasis can and should be tested.

Notes

Merlins breeding in Cornwall.—On 3rd June 1954 I saw a female Merlin (*Falco columbarius*) by a disused airfield near Perranporth, Cornwall. The following day she was accompanied by a male and I decided to watch from cover. As a result, I was able to locate the nest—a scrape with two eggs by a large clump of heather. Two more eggs were eventually laid and the clutch remained at four until 4th July, when one disappeared. On 9th July I found that the three

PLATE 68. Adult Ivory Gull (*Pagophila eburnea*), Shetland, February 1962. Above, close-up of the white plumage, dark eye, long wings, short black legs and stout grey and orange bill (*photo: J. Peterson*). Below, in flight with young Kittiwake whose black wing-tips are invisible against the dark background (*photo: C. J. Watson*)

PLATE 69. Destruction of wild life habitat on farmland. Above, pond pollution from dumping of herbicide canisters, Cambridge, June 1962; all emergent vegetation is dead. Below, replacement of hedges by wire, Huntingdon, June 1962; note absence of broad-leaved weeds in sprayed crop on right (pages 428-435) (*photos: N. W. Moore*)

PLATE 70. Destruction of wild life habitat on farmland. Above, two hawthorn hedges ten months after severe damage from stubble burning, Huntingdon, June 1962. Below, modern hedgeless landscape, with some of the former hedge lines indicated by a few scattered old trees, Huntingdon, June 1962 (*photos: N. W. Moore*)

PLATE 71. Adult Black-headed Gull (*Larus ridibundus*) combining melanism with albinism, Kent, February 1962. All the primaries on both wings are white, and the legs and feet have melanic patches. The summer feathers beginning to show on the head also seemed black rather than brown (pages 435-436) (*photos: Pamela Harrison*)

remaining eggs had hatched. By 30th July, the last time that I saw the young in the nest, their feathers were growing well. On 6th August the nest was empty and I concluded that the young had flown.

This is the only record of Merlins breeding in Cornwall. The airfield was subsequently used for gliding and there was too much disturbance for further nesting. DAVID F. SMITH

Waders being caught by cockles and mussels.—A number of wader species feed on bivalves, particularly edible mussels (*Mytilus edulis*) and common cockles (*Cardium edule*). At Shellness, Sheppey, Kent, during the winter of 1961-62, my attention was directed to this because I saw several individuals which had live bivalves clamped on their bills. The first, a Redshank (*Tringa totanus*), was put up from the water's edge after dark on 16th December 1961. In the beam of my torch, I watched it flutter to a height of about twenty feet and then nose-dive to the beach, where it was easily caught. The whole of its bill, right to the base, was enclosed by a live mussel some two inches long and it was unable to move either mandible. A tin-opener had to be used to remove the mussel which was found to weigh 14.1 gm. against the bird's 149.3 gm. When released next day, the Redshank flew off strongly.

On 7th January 1962 I noted two separate Oystercatchers (*Haematopus ostralegus*) with mussels on their bills. Both were seen only in flight, but I was close enough to see that the mussels were definitely clamped on and presumably live, and not just incapacitated ones which the birds were carrying away to eat. These Oystercatchers appeared to fly normally, but a Knot (*Calidris canutus*) which I watched on the same day had considerable difficulty in flying with a cockle on its bill. This bird was most reluctant to leave the ground and I got very close to it on four occasions; before I found that it could fly, I tried to catch it and chased it along the beach for some minutes. In flight it had to adopt a curious "upright" position to counter-balance the weight of the cockle and it could not keep up with flocks of its own kind.

In addition to these records, I have older ones of another Oystercatcher and a Grey Plover (*Charadrius squatarola*) with mussels on their bills.

Subsequent observations, during January and February 1962, showed that the feeding habits of some of these waders are such that cockles can easily attach themselves to their bills, and the same is probably true of mussels. The species I actually watched feeding on cockles, on both rising and falling tides, were Turnstones (*Arenaria interpres*), Knots, Grey Plovers and Redshanks. All seemed to use the same methods, though the Redshanks tended to hunt in small parties,

often very close together and with much bickering. The birds would wade in shallow water at the tide's edge, watching the bottom intently if this was sandy or muddy or picking over the shells if there was a cockle bank. When one found a cockle open it would seize it by its siphon and shake it vigorously. If the shell closed partially or completely, the bird would stay in the water (or run back to it) and repeatedly dip the cockle. Occasionally this resulted in the latter's reopening, but in most cases it was ineffective. Normally the bird would then shake and peck at the cockle until it opened, whereupon it would drop it on dry sand or mud and pick it clean. Approximately one third of all the cockles picked up by waders appeared to close completely and were abandoned after the birds had hammered on the shell a few times without result. Twice I saw a cockle close on the bill of a Redshank. In each case it was shaken off eventually, but one bird had the greatest difficulty in dislodging it from its lower mandible.

I have never found a wader dead with a cockle or mussel on its bill and it is interesting to conjecture whether the bivalve is forced to release its grip before the bird starves to death.

It is also worth noting that *The Handbook* does not include cockles in the food of either the Turnstone or the Knot, and does not mention mussels for either the Redshank or the Grey Plover. J. Hori

Turtle Dove crossing the Atlantic westward on a ship.—At the beginning of May 1962, during a crossing of the Atlantic from Avonmouth, Gloucestershire, to Montreal, the S.S. *Birmingham City* was invaded by land birds when well clear of the south-west coast of Ireland. The most interesting of these was a Turtle Dove (*Streptopelia turtur*) which was first seen on 1st May. The ship's position was then 51°16′N, 21°47′W, or about 400 miles west of south-west Ireland. On 3rd May I found a freshly dead Turtle Dove, but that afternoon one was still flying quite healthily about the ship. I last saw this bird at noon on 6th May, when the ship's position was 46°31′N, 56°32′W, or 17 miles off Miquelon Island, south of Newfoundland. The weather throughout the crossing had been generally mild and clear with easterly and south-easterly winds.

Stephen E. Chapman

Two Cuckoo's eggs in one nest.—In 1962 the last time we heard the bubbling call of a female Cuckoo (*Cuculus canorus*) in the vicinity of our garden at Bodorgan, Anglesey, was on 25th June. On 30th June we found a nest of a pair of Dunnocks (*Prunella modularis*) containing

three of the owners' eggs and two Cuckoo's eggs. The latter resembled dark eggs of Meadow Pipits (*Anthus pratensis*) and were exactly similar in appearance, strongly suggesting that both were laid by the same bird. In this connection it is interesting to note *The Handbook*'s statement that "towards the end of the season a hen may very rarely lay 2 eggs in one nest". The nest was a few inches inside a close-knit, topiary hawthorn (*Crataegus monogyna*) and must have presented the Cuckoo with quite a problem if she laid her eggs in the normal way.

Early on 4th July the nest contained two newly-hatched Cuckoos, two newly-hatched Dunnocks and one egg. That evening the situation remained unchanged, but next morning there was only one Cuckoo and one Dunnock and the latter had disappeared by evening. The Cuckoo, which constantly advertised its presence by loud demands for food, was destroyed by a predator on the night of 15th-16th July.

L. S. V. and U. M. VENABLES

Blackbird attacking Slow-worm.—At about 7.30 a.m. BST on 4th June 1962, near Weymouth, Dorset, I noticed a cock Blackbird (*Turdus merula*) attempting to carry off what I took to be a large worm. At my approach the bird fluttered along the ground and, after a few yards, dropped its burden on the path before flying away. I then found that the creature was a Slow-worm (*Anguis fragilis*), about six or seven inches long. Apparently unharmed, it slid away into the long grass.

E. J. STOKES

[There are several records of Blackbirds actually killing Slow-worms (e.g. *Brit. Birds*, 37: 116, 157). They have also been known to take Common Newt (*Triton vulgaris*), Common Eel (*Anguilla anguilla*), Common Frog (*Rana ridibunda*) and Common Lizard (*Lacerta vivipara*), as well as to attack a small Grass Snake (*Natrix natrix*) (*Brit. Birds*, 37: 157; 45: 77; 48: 185; 53: 32).—EDS.]

Lesser Whitethroats breeding in Northumberland.—There are very few records of Lesser Whitethroats (*Sylvia curruca*) breeding in Northumberland and none in recent years. It therefore seems worth recording that during the last six springs a total of seven singing males have been observed in the vicinity of Fenwick, near Beal, in the very north of the county. Three of these birds stayed all summer. There were two males in 1962 and on 23rd June one of them was found to be paired and feeding young already out of the nest, in an area of elders, thick scrub and brambles.

A. BLACKETT and W. ORD

Wood Warbler's nest without a dome.—On 6th June 1962, in the Forest of Dean, near Parkend, Gloucestershire, I was searching for nests of Wood Warblers (*Phylloscopus sibilatrix*) when I found one which lacked all trace of the normal dome. The site was a typical one in the shade of some oak trees, where light bramble and a little bracken and grass were growing. The nest was among dead leaves under a very thin cover of low brambles, and was typically lined with dry grass (and no feathers)—but the lack of a dome made it look more like the simple cup of a Tree Pipit (*Anthus trivialis*) or Robin (*Erithacus rubecula*), though it was far more open than these usually are in similar sites. There was no question of its being a normal nest that had been interfered with.

The nest contained six newly hatched young. I fetched Dr. Bruce Campbell and from a distance we watched with binoculars until the parents came to feed the young. They were unmistakably Wood Warblers. I understand that P. A. Banks went to the site on 10th June and that the young were still there then, but on the 15th Dr. Campbell found the nest flat and empty. M. PHILIPS PRICE

[Willow Warblers (*Ph. trochilus*) occasionally build nests without domes, particularly if they are sunk in fernstocks or grass tussocks but we know of no previous record of a Wood Warbler's nest being open in this way.—EDS.]

Nest sanitation by unfledged Spotted Flycatchers.—The recent note by W. S. Medlicott on nest sanitation by unfledged Pied Flycatchers (*Muscicapa hypoleuca*) (*Brit. Birds,* 55: 192-193) prompts me to record the following. In June 1958 a pair of Spotted Flycatchers (*M. striata*) nested on the window sill of my mother's bedroom at Colyton, Devon. The nest received support and protection from a branch of a vine that grew along the edge of the sill, but it was entirely visible from the room. The adult birds took no notice at all of watchers behind the pane and the window was not opened while the nest was occupied. There were four nestlings, all of which eventually flew successfully. While they were in the nest my mother took a great interest in them and when I next visited her, after the young had fledged, she told me that it was they who kept the nest clean. She said that they picked up their droppings in their bills and passed them over to the adults who perched on the vine at the edge of the nest. It was her impression that the faecal sac served as a meal ticket, the young bird which had handed one over being the one that was usually fed first when the parent next returned to the nest! My mother died two years ago and so I am unable to obtain any additional details, but she described the above happenings to me more than once.

MARGARET K. JONES

Goldfinch nesting in Virginia creeper.—On 2nd July 1962 Colin Hudson pointed out to me that a pair of Goldfinches (*Carduelis carduelis*) were visiting a spot about twenty feet up in Virginia creeper (*Parthenocissus quinquefolia*) on one of the walls of the Forester School, Parkend, Gloucestershire. On 13th July, we put up a ladder and found a Goldfinch's nest from which a brood had apparently fledged. It was supported by about half a dozen leaf-stalks and not by the woody stem of the creeper, and was hidden by the large leaves. Such a site is exceptional for this species in my experience.

BRUCE CAMPBELL

Chaffinches crossing the Atlantic westward on a ship.—During the whaling season of 1960-61, I was a biologist on board the whale factory ship *Southern Venturer*. The vessel left Tönsberg, in southern Norway, on 4th November 1960, and steamed across the North Sea, through the English Channel and across the North Atlantic to Aruba, an island in the Lesser Antilles off the north-west corner of Venezuela. While we were crossing the North Sea, about 30 Starlings (*Sturnus vulgaris*) spent an hour on board. On 7th November, during the passage through the English Channel, several finches flew near the ship and at 1630 GMT a female Chaffinch (*Fringilla coelebs*) was seen on board. On the following day (noon position 45°52'N, 09°53'W) there were six Starlings, one Robin (*Erithacus rubecula*), a Goldcrest (*Regulus regulus*) and several Chaffinches on the ship. From then on, throughout the crossing, Chaffinches were seen regularly on deck and six were counted on 10th November (noon position 39°37'N, 18°25'W). On 15th November (28°47'N, 43°27'W) several Chaffinches were still aboard, though it was difficult to determine the exact number. After this date, only a single bird was seen and this was last recorded, apparently in good condition, at 1000 hours on 21st November, just five hours before the ship docked at Aruba (approximately 5°N, 70°W). In the circumstances, it is reasonable to assume that the bird could have found its way ashore.

It is worth adding that the *Southern Venturer* carried a pen of pigs and a large coop of hens on her decks. These provided grain on which the Chaffinches fed. Most transatlantic ships would be unlikely to have such a readily available supply of food and fresh water, so that birds would have a smaller chance of surviving a prolonged oceanic crossing.

D. T. CRISP

House Sparrow with temporarily deformed beak.—On 14th June 1962 a very weak juvenile House Sparrow (*Passer domesticus*) was brought to me at Sheffield, Yorkshire. It was very thirsty, its mouth was filled with dirt, and its upper mandible was 4 mm. shorter than

the lower. The last appeared to be the cause of all the bird's troubles and it could not feed properly. I cleaned out its beak and kept the bird in a warm box at 70°F for fifteen days, feeding it on raw meat. During this time, the upper mandible grew to match the lower, until the bird had a normal bill of 12 mm. and could feed itself. I released it and it flew away quite well.

This deformity would probably have proved fatal if the bird had remained in the wild, but it seems to have been of rather a different nature from the other temporary deformities described in the recent paper by D. E. Pomeroy (*Brit. Birds,* 55: 49-72, especially 54).

W. A. TIMPERLEY

Nestling House Sparrow killed by cotton wool.—On 29th June 1962 a dead nestling House Sparrow (*Passer domesticus*), perhaps a week old, was found by J. W. F. Stewart in the driveway of a house in Middlesbrough, Yorkshire. It was near a small nesting colony in the ivy-clad side of the adjacent house, but at such a distance that it must have been carried to the spot where it lay. Its mouth was firmly clamped over one end of a wad of cotton wool almost as long as itself. I cut open the jaws and found that the wool covered the floor of the mouth; a wisp reached as far as the throat without penetrating the oesophagus. Death may have resulted from asphyxia following the covering of the glottis (which opens near the back of the tongue) or from the exhaustion of continued struggling with the wool, and the interruption of feeding may also have been a factor.

Although one cannot be sure how this event came about, it seems likely that the wool, as a loose component of the nest, somehow found its way into the bird's mouth during feeding and that it was not dislodged by head-shaking, the usual reaction of a nestling in such circumstances. Food is of course normally placed well back in the throat by the parent, certainly behind the tongue. Probably the dry cotton would have stuck to the nestling's mouth as it absorbed the buccal secretions.

IAN F. STEWART

The A. W. Boyd Memorial Observatory

The A. W. Boyd Memorial Observatory at Rostherne Mere, Cheshire, was opened by James Fisher on 21st July 1962, at a ceremony attended by a number of Cheshire and Lancashire naturalists, representatives of the county, parishioners of Rostherne, and relatives and friends of Arnold Boyd himself.

Placed on a steep bank overlooking Rostherne Mere National Nature Reserve, the observatory is an agreeable building, designed

by S. Colwyn Foulkes, the well-known architect, and constructed of cedarwood cladding with a shingle roof. It is probably the first such structure to have been designed by an architect. Inside, it consists of one room from which steps descend to the observation deck; the latter is equipped with a high-powered telescope generously presented by Christopher Budenberg, and with a set of chairs kindly given by Alan Gee. The observatory will be available for the use of holders of permits, which are obtainable from W. Mulligan, 432 Parrs Wood Road, East Didsbury, Manchester 20, at a cost of 5s. (plus postage) to cover upkeep.

It is generally agreed by Arnold Boyd's friends and family, and by the naturalists who have seen it, that this memorial, mainly paid for by the many subscribers to the A. W. Boyd Memorial Appeal, is a happy and fitting means of remembering him.

Reviews

Birds in Britain. By Kenneth Richmond. Odhams, London, 1962. 160 pages; 80 pages of photographs, including 8 in colour. 30s. Special edition with two 45 r.p.m. records of forty-seven songs and calls recorded by John Kirby, 63s.

This book is announced as a "practical guide to identification, behaviour and habitats". Regarded as a popular guide for people who desire to have in reasonable compass an account of those of our native birds which they are likely to see, and some description of the kind of country in which they are most likely to find them, the book may fairly claim to fulfil its intention. It does not profess to include taxonomic detail, technical studies of specialised behaviour or exhaustive determinations of range.

More scientifically minded ornithologists, some of whom come under Mr. Richmond's strictures for the arid or difficult manner in which they present their results, may well in their turn point to the colloquialisms and occasionally excessive looseness of his own writing, and think his style more appropriate to journalism than to science. But it conveys to the ordinary reader something of Mr. Richmond's real enthusiasm for bird life and its proper protection, and carries deft descriptive touches based on his own close observation. In an introductory chapter, Mr. Richmond briefly outlines the more obvious stages in the progress of bird-watching in Britain. The high standard of skill in identification, aided by modern binoculars, good textbooks and the literature of organisations like the British Trust for Ornithology, is contrasted with the more amateur approach of the older field naturalists and particularly with the attitude of the countryman

of the past, who took so much for granted without troubling to know anything about the majority of the small and less easily identified birds. Considerations of space have no doubt compelled Mr. Richmond merely to mention rather than to discuss the general problems of biology to which the interests of ornithologists have largely turned, but he indicates at least their scope (as with migration) and says enough to remind the young observer that he has more to do and think about than to compile a list of birds seen.

The rest of the book consists of compact general descriptions of the species normally frequenting these islands, in main groups, with notes on behaviour and habitats. Mr. Richmond's estimates of the status of some of the birds of prey could be improved by reference to this journal's own investigation published in 1957. It is also surely contrary to all recent assessments to say that the Sparrowhawk continues to hold its own. On present distribution, the Midlander who set out "reasonably sure" of finding a pair or two of Woodlarks on the Clent Hills would be an optimist. On such points of detail (and on his perverse argument for sacrificing science to expediency by dealing with the Hedge Sparrow among the true sparrows) he is open to challenge, but young people with keenness of purpose and of eye, to use his own phrase, into whose hands some friend puts this book, should be able to make good and grateful use of it. The type is clear and easily read and the numerous photographs by the author are good; many of them, indeed, are excellent.

With the de luxe edition (63s.) are included two records of bird calls and songs by John Kirby, selected from recordings used in B.B.C. programmes. These are first-rate, especially the calls of the aquatic birds, the churring of the Nightjar, and some of the warbler songs, for example that of the Wood Warbler. They transport the listener to the surroundings of the birds uttering them. HURCOMB

A Bird and its Bush. By Michael Lister. Phoenix House, London, 1962. 142 pages; 35 photographs and 16 text figures. 16s.

What is the extent of the Palearctic region? How does one read a weather map? What is a sere? How many young ornithologists, just beginning seriously to read the scientific literature, have asked such questions and wondered where they could find the answers. This book will help them greatly. It deals with faunal regions, geology and soil, weather, vegetation types and similar matters. And there is a splendid and stimulating bibliography of 254 titles.

The book also discusses bird ecology and methods of recording habitats, but this section is, I feel, less successful than the rest. This is partly due to the author's not being clear about the type of reader

he is writing for. He tries to deal with beginners and more advanced workers at the same time; for example, at one stage he explains that "it is quicker and simpler to refer to a point simply as 'A' than as 'the NW corner of the SW field' ", and then a couple of pages later he presents Emlen's formula for computing "per cent cover of tree or shrub strata". This part of the book is contained in some thirty pages, which might lead one to expect extreme compression and simplification. In fact, the matters dealt with receive detailed and often discursive treatment. A lack of balance results, and the author is trapped into making such statements as "the primary function of . . . mixed parties is a co-operative hunting drive" without leaving himself space to support this surprising view.

Discussion of habitat surveys is based on W. B. Yapp's classification, originally published in 1955 in *Bird Study* (2: 111-121) and now given in full as an appendix to this book. This itself is so complex that it has as yet found little favour with field-workers, but Mr. Lister goes into even greater detail. Some of us might consider that, if we were to follow such a plan, we should be spending all our time studying the habitat and never see the birds. It is a pity that there is no description of the classification system devised by C. S. Elton and R. S. Miller (*J. Ecol.*, 42: 460-496) on a basis of structural characters and used by the Bureau of Animal Population at Oxford, nor of the modification of this system now in use by the Nature Conservancy for surveys of National Nature Reserves. These are far more practical. Nor is there any reference to those pioneer ecological papers on the birds of the Camargue and the Coto Doñana, which were published in *British Birds* in 1957 and 1958.

However, it is no bad thing to be made to think about our approach to these fundamental problems, and I commend Mr. Lister's book to serious field-workers.

R. A. O. HICKLING

Bird Song Recording. By Frederick Purves. Focal Press, London, 1962. 92 pages; numerous text-figures and diagrams. 7s. 6d.

This recent addition to the series of Focal Sound Books is the first book to be devoted entirely to the recording of bird voice. Its publishers claim that it is complete in its coverage of the subject, but the author more modestly aims it at "the tape-recorder enthusiast in search of new subjects and the bird-lover interested in this new way of enjoying and studying bird song".

The eleven chapters are devoted to: birds and their songs; identification; tape-recorders, microphones and their use; recording in the garden and in the field; dealing with extraneous noises; presentation of the results; caring for garden birds; and an introduction to ringing. Of these, the chapter on bird recognition would have been best

omitted, reference being made to the many reliable, authoritative and inexpensive books already on the market.

Many of the would-be bird-recordist's questions are answered and a great deal of useful information is given on the subjects of choosing a recorder, extension cables, matching of impedances, avoiding the effects of wind, and field techniques. Characteristics of the different types of microphone are discussed at some length and recommendations are made as to their uses. Unfortunately very little is said concerning the parabolic reflector, which is often depicted in the illustrations but never described with understanding in the text. Thus, technically, the book stops at "box Brownie" level when it might have been, in the same amount of space, of great help to ornithologists capable of making a serious contribution to bio-acoustics.

Great emphasis is placed on the necessity for retaining only the best of one's recordings, but it would be unwise to accept too literally the author's oft-reiterated dictum that only the best thirty seconds of song from any one species should be added to the collection. This approach may be perfectly valid if one aims at nothing more than entertaining one's non-specialist friends or tempting a harassed radio producer, but such a rule could do immeasurable harm to the advancement of bird recording as an ornithological technique if it gained general acceptance at so early a stage.

This little book has much to offer to the reader requiring help in the rudiments of bird-voice recording, but it is a pity that many of the points could not have been illustrated by examples taken from field experience. Technically, it is sound so far as it goes, but one becomes ornithologically uneasy when reference is made to recording the "meadow lark" and at least one eminent eyebrow will be raised at the statement that "the song of the chaffinch doesn't vary much from one end of the country to the other". E. D. H. JOHNSON

ALSO RECEIVED

Morphological Differentiation and Adaptation in the Galapágos Finches. By Robert I. Bowman. University of California Press, Berkeley and Los Angeles, 1961. No price given.

Cliffs of Freedom (*The Story of Skomer Island*). By Roscoe Howells. Gomerian Press, Llandysul, 1961. 18s. 6d.

Birds of the Southern Third of Africa (*African Handbook of Birds, Series Two*). By C. W. Mackworth-Praed and C. H. B. Grant. Vol. 1. Longmans, London, 1962. 50s.

Contribution à l'Etude des Vertébrés Terrestres en Afrique Tropicale. By Kai Curry-Lindahl. Institut des Parcs Nationaux du Congo et du Ruanda-Urandi, Brussels, 1961. No price given.

Penguin Summer. By Eleanor Rice Pettingell. Cassell, London, 1962. 25s.

Check-List of the Birds of Cley and Neighbouring Norfolk Parishes. By R. A. Richardson. Cley Bird Observatory, 1962. 7s. 6d.

Timmy (*The Story of a Sparrow*). By Clare Kipps. Arthur Barker, London, 1962. 8s. 6d.

Birds of the Norfolk Broads. By R. Jones. Jarrold, Norwich, 1962. 5s.

Letters

The Hastings Rarities

Following the publication of the papers on the Hastings Rarities in our August issue (*Brit. Birds*, 55: 281-384), we have received a number of letters and comments, mostly very favourable, but those reproduced below are the only ones which have been sent for publication.—EDS.

Sirs,—In the analysis of the Hastings Rarities—and let me say in passing that I am in full agreement with the general conclusions and admire the care and thoroughness of the investigation—I find one unfortunate passage that seems to require some modification. You write: "Only 70 of the 542 specimens in Appendix A have any name of shooter or finder mentioned: eleven of these are M. J. Nicoll and four G. Bristow, but only 13 of the remainder have more than a surname and most of those are such common and untraceable ones as Sargeant, Clarke, Mills and Miller. In fact, despite enquiries, we have not been able to trace and interview any of the people concerned, nor with certainty any members of their families."

However, when I turn to Appendix A, I find the name of Southerden fifive times. The Southerden family have lived for generations at Jury's Gap, in the house by the Midrips; they still live there; and everyone who is familiar with that part of the marsh knows the family well. The Southerdens have always paid attention to the birds of the Midrips and the surrounding country, and their knowledge of birds, though no doubt it is better on ducks, waders, etc., includes some knowledge of small Passerines. The older generation, of course, were wildfowlers, who used a gun whenever they saw a strange bird. It is inevitable, I am afraid, that the Hastings records as a whole must be rejected, and so, no doubt, some perfectly good records will go together with a lot that are bad. But in justice to the good name of a well-known local family, I think it important that these facts should be published.

H. G. ALEXANDER

Sirs,—May I open these comments by stating that of course I approve in principle that measures should be taken to correct scientific data when this is deemed necessary, and it must be admitted that there

appear to be a number of exceptional features in the problem presented by the Hastings Rarities, as well as in its method of solution.

In *The Times* of 15th August I saw fit to record certain first-hand personal experiences in view of the insinuations in *British Birds,* widely repeated in the National Press, not only against the late George Bristow but also the late W. Ruskin Butterfield, whom I also knew. I consider in all fairness that these should be more widely known, and I need not write in defence of Mr. Butterfield as several others have already done so.

My experience briefly relates to, firstly, the sighting by myself of several rarities in the immediate district of Hastings, and, secondly, my own personal business experience of Bristow. The former included an undoubted Rufous Warbler (*Agrobates galactotes*) at the end of May 1913 in St. Helen's Wood, Hastings, and a Red-rumped Swallow (*Hirundo daurica*) a good many years previously at Hollington on the outskirts of Hastings when I was but a Preparatory School boy. The latter shows the small sum (10s.) paid to Bristow for the specimen of Audubon's Shearwater (*Procellaria l'herminieri*), the receipt for which I still hold. For a Passenger Pigeon (*Ectopistes migratorius*), a bird which Bristow knew was extinct, he received £1 or 25s. to the best of my recollection. To these I can add two Black-winged Stilts (*Himantopus himantopus*), which I bought from him, honestly sold as lacking any data and not as British taken with a fictitious locality in Kent or Sussex on any particular date, and therefore specimens worth their price. All this does not accord with the suggestions of large sums of money involved in the Hastings Rarities.

I think it is inevitable that the Report will invite criticism, and, if I may be permitted to express my own views, I would say that it is the matter of timing which is its most unfortunate feature. This is particularly so in view of the fact that Dr. David A. Bannerman's major work on *The Birds of the British Isles* (1953 and still being published) was allowed to go forward with little or no advice of the present action which I understand was instituted in 1954.

One may also ask whether the statistical analysis of just one facet of ornithological activity divorced from the rest is likely to reflect a proper perspective? Ought not a similar treatment of *all* sight records, both those rejected and accepted, to have been made? The results might be illuminating. I believe there have been sight records within the past ten years of a Slender-billed Curlew (*Numenius tenuirostris*) and a Brown Flycatcher (*Muscicapa latirostris*) seen by competent ornithologists, which were rejected. It is within my own experience that the record of at least one rarity previously submitted as a sight record was rejected, and on being resubmitted as a specimen collected, was admitted as authentic, as in fact it was.

There is also another aspect that would most certainly affect a statistical analysis, and that is that there undoubtedly exist specimens collected which have never been recorded or even seen by any competent authority. These are matters concerning the problem which demand serious consideration, particularly in view of the inordinate delay in the action taken, when many useful contacts are no longer available, who could possibly have supplied vital evidence, either in favour of or against authentication of any particular specimen.

Why was such delay necessary? The late H. F. Witherby did not see fit to institute any such enquiry during his lifetime, while the suspicions were current and red-hot, and it is well known that he held very strong views on the matter of substantiation of records of all kinds. What direct fresh evidence has come to light since to justify the wholesale discrediting of *all* these specimens and, of course, much of the work of the eminent ornithologists of that time, who were entrusted with the responsibility of investigating these cases and who, incidentally, were by no means blind to the possibility of fraud?

I suggest that the time is long past when such action should properly have been taken, and opinion, both as to the wisdom and the infallability of the report in its entirety, is bound to remain divided.

JAMES M. HARRISON

[Having placed all relevant facts known to us before our readers, we must leave them to judge our conclusions on the Hastings Rarities. On the question of timing, we do appreciate and sympathise with the embarrassment of all those, ourselves included, whose previous reliance on some or all of these Hastings records resulted in published statements which can no longer be sustained. We must, however, recall that queries about the authenticity of the records have actually been published, as our quotations showed, at intervals since 1911. Every painstaking writer since has had to make up his mind whether to disregard these warnings or not. Owing to the remarkably successful concealment of the direct evidence, it has only recently become possible, by the use of massive indirect evidence, to accumulate what amounts in our view, and in that of practically every ornithologist we know, to conclusive proof that the Hastings Rarities *en bloc* are not genuine, although certain genuine records may well be among them.

We invited Dr. Harrison to explain his views to our readers in his own words in order that justice should be done to differing opinions, but we do not, as our editorial shows, know of any justification for saying that ornithological opinion remains divided on the only issue that really matters, which is whether the Hastings Rarities are true or false. If there is anyone who thinks that they are true, we should be very glad to give space to his reasons for doing so.—EDS.]

Sirs,—I found the August number of *British Birds* of the greatest interest and am delighted that so much old evidence has survived to confirm the suspicions which the late Dr. Claud Ticehurst voiced to me as long ago as 1919. I think you have done a valuable piece of work. At the same time, though many of these Sussex and Kent records clearly needed exploding, I feel very sorry for those of the late Michael Nicoll and other reputable naturalists which have fallen by the wayside in the purge. I also have much sympathy for the writers of recent bird-books and it is sad that this enquiry was not undertaken earlier.

Two century-old quotations from *The Ibis* may be relevant as illustrating the attitudes which were building up among dealers and collectors years before the Hastings era. In 1860 (p. 415) the editor remarked, "It is melancholy to see what sums of money and simple zeal are often squandered on the most worthless accumulations from the shops of dealers". In 1863 (p. 373) "Oophilus" quoted two catalogues of sales in London of eggs which had included those of Cirl Buntings (*Emberiza cirlus*) from Greenland, of Egyptian Vultures (*Neophron percnopterus*) and Calandra Larks (*Melanocorypha calandra*) from Guernsey, and of Rough-legged Buzzards (*Buteo lagopus*), Hobbies (*Falco subbuteo*), Scops Owls (*Otus scops*) and Three-toed Woodpeckers (*Picoides tridactylus*) from Arran!

J. K. STANFORD

Sirs,—Now that the problem of the Hastings Rarities has been very thoroughly dealt with, the time seems opportune for an appraisal of other rarities on the British List. I refer in particular to the Kermadec, Collared and Capped Petrels (*Bulweria neglecta, B. leucoptera* and *B. hasitata*), Griffon and Egyptian Vultures (*Gyps fulvus* and *Neophron percnopterus*), Red-necked and Egyptian Nightjars (*Caprimulgus ruficollis* and *C. aegyptius*), Isabelline Wheatear (*Oenanthe isabellinus*) and Citril Finch (*Carduelis citrinella*). The Isabelline Wheatear and Citril Finch, both of which now rest on one record, have not occurred since 1887 and 1904 respectively. The length of time does not of course invalidate the records, but one wonders whether some of the above species, especially the wheatear, were correctly identified, or whether any of them, such as the finch, could have been escaped cage-birds, and whether on the evidence available at the time they would today be accepted by the Rarity Records Committee. All these records may be genuine, but it would be as well if the authorities put the house further in order by re-examining the evidence for the inclusion of these, and perhaps other species, on the List.

K. D. SMITH

Sirs,—The August issue of *British Birds* came three days ago and it certainly made a bang. I read it non-stop; it was like the best

criminal story I could think of and most exciting reading. But perhaps it came as rather a sad surprise to many and I can understand that this large-scale cheating must be a terrible matter for some. So, after the Piltdown forgery, Britain is leading us again in a field which seems to us so innocuous to-day!

However sad this is, I feel it was more than justified to put the record straight, as you put it, because there is a lesson in this matter which applies to a wider area than England. Indeed, I wonder if there are not other "Hastings Rarities". In the present case a scientific approach detected them very ably, but what about deceptions concerning *single* occurrences anywhere else? I think it is inescapable that many other older records, especially of rarer and really rare species, will have to be re-examined seriously, and probably on the Continent as well. R. LÉVÊQUE (*Geneva, Switzerland*)

Sirs,—Would not all the trouble and dismay caused by the Hastings Rarities have been avoided if we did not have this custom of applying the label "British" to every rarity authenticated only once in this country. Surely some of these birds are not British in any real meaning of the word. High winds, escapes from cages or other concatenations of circumstances over which they have no control force them here against all their inherited instincts, and they ought, I contend, to be treated merely as unwilling foreign vagrants. Indeed, they are no more British than shipwrecked mariners or fugitive slaves from abroad.

I suggest that in such works as *The Handbook of British Birds* and the *Check-list of the Birds of Great Britain and Ireland* they should, if worthy of any mention at all, be relegated to an appendix. There are numerous rare birds—residents, yearly visitors, passage-migrants—which properly rank as British, and it might be argued that it would sometimes be difficult to draw the line. Indeed, it is impossible to foretell every question that might arise, but a sensible judgement could usually be made from the normal likelihood of such occurrences and the number of instances. It is true that birds have a habit of extending their range or, if circumstances become favourable, of returning after many years to former habitats, but in such cases the species could be removed from the appendix and placed in the body of the work.

I realise that every precaution is taken before a bird is admitted to the British List, but every precaution is apparently not enough, as has been shown by the Hastings case. However conservative the decisions are, must there not always be a haunting fear of mistakes?

It was the lure of "British-shot" that induced collectors of other days to pay considerable sums for skins or stuffed birds, just as it is

the lure of "British-taken" that still induces egg-collectors, surreptitiously defying the law and public opinion, to pay considerable sums for eggs. In one sense, of course, egg-collectors are on safer ground than were the collectors of skins, as a bird nesting in Britain is automatically a British bird, but in a more urgent sense there is nothing to choose between them, the tragic farce being that, although a bird may be excessively rare in this country, it is likely to be reasonably common in another. In fact, to modern concepts the collecting of "British-taken" eggs is not alone shocking, but silly. There is no difference between British and foreign specimens, and one can only suppose that the rabid egg-collector finds a morbid satisfaction in gloating secretly over his illicit and worthless loot.

As has been pointed out to me by a friend, bird-watching is in itself a form of collecting and, as collecting is an instinct deeply ingrained in human nature, it may be that the enthusiasm of some bird-watchers might wane if the present theory of a rarity were to change. But, after all, ornithology is a science and, even if sentiment must be respected and encouraged, accuracy takes precedence over everything. Moreover, an appendix entry would be of value, and if, let us say, it developed into an integral section of *The Handbook*, only virtual certainties being admitted, it would steadily grow in importance. Altogether, therefore, I scarcely imagine that to insist on a strict view of what is British is going to upset many.

May I close this letter by stating that I fully agree with the conclusions summarised on pages 341-343 of the August number of *British Birds*. At the same time I believe that the British List should be minutely overhauled by a panel of experts and that all birds whose presence in it is dubiously valid in the light of today's knowledge should be taken out; where the grounds are sufficient, they could go in the proposed appendix. RICHARD CURLE

Sirs,—May an obscure bird-watcher pay tribute to the skilful compilation of the facts of "The Hastings Rarities" so ably presented in the August issue of *British Birds*? The case could hardly have been more objectively stated and the years of research required to arrive at the conclusion have been well spent. The authors and their helpers deserve the thanks of all those who are seriously interested in British ornithology for thus setting the record straight. A. N. SYKES

Sirs,—I should like to make one small point with reference to the admirable and exciting discussion of the Hastings Rarities in your August issue. Is it not far more likely that the Eastern Desert Wheatear (*Oenanthe deserti atrogularis*) and Grey-headed Wagtail (*Motacilla flava thunbergi*) "recorded" from Scotney—Nos. 355 and 463 in Appen-

dix A—refer to the Scotney about two miles south-west of Lydd, and not to the Scotney near Lamberhurst as suggested by the map on pages 332-333? The literature is imprecise on this point, but the Lydd locality must surely have been intended.

RICHARD C. STONE

[When compiling the map we overlooked the Scotney near Lydd and we are most grateful to Mr. Stone for drawing our attention to it. We agree with his conclusion.—E.M.N. and I.J.F.-L.]

Recent reports and news

By I. J. Ferguson-Lees

[These are largely unchecked reports, not authenticated records]

It is with some diffidence that we resume this feature, because, though there have been requests for its return, we are not certain whether it is sufficiently appreciated to justify the work it involves. Perhaps we might also take this opportunity of pointing out that the amount of work is greatly increased when observations do not reach us until some weeks after the event, as this often involves considerable alteration to typescript and proofs. The summary which follows is largely confined to the two months from mid-July to mid-September.

The main characteristic of the autumn so far has been the number of American birds. As usual, **Pectoral Sandpipers** (*Calidris melanotos*) have dominated the picture and no less than twenty-seven have been reported in the Isles of Scilly (seven), Cornwall, Hampshire, Sussex, Kent, Middlesex, Suffolk, Norfolk, Lincoln, Nottingham, Derby, Fair Isle and Co. Kerry. But at least seven other species of waders have also been represented. These have included **Buff-breasted Sandpipers** (*Tryngites subruficollis*) in the Isles of Scilly (three) and Northamptonshire, **Lesser Yellowlegs** (*Tringa flavipes*) in Hampshire, Middlesex and Sussex, a **Wilson's Phalarope** (*Phalaropus tricolor*) in Cornwall from 23rd August, a probable **Semipalmated Sandpiper** (*C. pusilla*) at Cley (Norfolk) on 12th August, a **White-rumped Sandpiper** (*C. fuscicollis*) at Minsmere and Walberswick (Suffolk) from 20th August to 7th September, a **Solitary Sandpiper** (*T. solitaria*) at Nottingham from 24th August to 2nd September, and a **Stilt Sandpiper** (*Micropalama himantopus*) at Chichester (Sussex) from 1st to 7th September. Nor have the records been confined to waders. A female **Blue-winged Teal** (*Anas discors*) was shot at Pembrey (Carmarthenshire) on 10th September and an **American Bittern** (*Botaurus lentiginosus*) appeared on Bardsey (Caernarvonshire) on the 12th, only to die three days later. Lastly, a **Bobolink** (*Dolichonyx oryzivorus*) was trapped on St. Agnes (Isles of Scilly) on 19th September.

Generally speaking, it has been a poor autumn for Scandinavian and eastern migrants. For example, the number of **Bluethroats** (*Cyanosylvia svecica*) has been well below average. However, as we go to press, we hear of a scattering of **Barred Warblers** (*Sylvia nisoria*) and **Red-breasted Flycatchers** (*Muscicapa parva*) in mid-

September, and the first **Yellow-browed Warbler** (*Phylloscopus inornatus*) in Norfolk on the 21st. While **Icterine Warblers** (*Hippolais icterina*) have been recorded at various localities, mainly on the east and south coasts, **Melodious Warblers** (*H. polyglotta*) have completely outnumbered them. Nine Melodious have been ringed on Bardsey alone and eight more on Great Saltee (Co. Wexford); in all, at least twenty-five have been ringed and another fifteen seen. The prevalence of west European species is further illustrated by the fact that no less than three **Bonelli's Warblers** (*Ph. bonelli*) have been trapped on Great Saltee (1st to at least 16th September) and Bardsey (1st, and a different bird 15th to at least 19th), while the more easterly **Aquatic Warbler** (*Acrocephalus paludicola*) has been rather scarcer than of recent years, the only ones we have heard of being at Sandwich Bay (Kent) and at Kenfig Pool and Oxwich Marsh (both Glamorgan).

Other Passerines have included **Rose-coloured Starlings** (*Sturnus roseus*) at Rousay (Orkney) on 1st August (dead) and at Newcastle-upon-Tyne on 21st and 24th August, a **Great Reed Warbler** (*A. arundinaceus*) at Sandwich Bay on 19th August, an **Olivaceous Warbler** (*H. pallida*) at Portland (Dorset) on 5th September, a **Yellow-breasted Bunting** (*Emberiza aureola*) on Fair Isle on 12th September, a juvenile **Lesser Grey Shrike** (*Lanius minor*) and a **Short-toed Lark** (*Calandrella cinerea*) at Cape Clear on 14th September (the former staying to at least the 20th), and a very few **Woodchat Shrikes** (*L. senator*) between Kent and the Isles of Scilly.

Another feature of the autumn has been the good numbers of Scandinavian waders—**Greenshanks** (*Tringa nebularia*), **Spotted Redshanks** (*T. erythropus*), **Wood Sandpipers** (*T. glareola*) and **Ruffs** (*Philomachus pugnax*)—though **Little Stints** (*Calidris minuta*) and **Curlew Sandpipers** (*C. testacea*), both of which nest further east in the Arctic, have been generally rather scarce since a few non-breeding adults went through in late July and early August. Flocks of Spotted Redshanks have included parties of up to fifty in Suffolk and one of sixty-six in Kent. Greenshanks and Spotted Redshanks have been unusually common in western districts from Lancashire to Somerset and there have even been good numbers of Ruffs and Wood Sandpipers in Ireland. With these species have come rather more **Temminck's Stints** (*C. temminckii*) than usual, as many as three being seen together in Norfolk and Kent and others occurring in a dozen or more counties from Northumberland to Sussex and even Somerset. **Grey Phalaropes** (*Phalaropus fulicarius*) do not usually appear very much before late September, but there was a scattering of early September and even latter half August records in counties as far apart as Cork, Kent and Huntingdon. Another September feature normally associated with winter's gales has been the occurrence of several sea-birds in inland counties, including a **Manx Shearwater** (*Procellaria puffinus*) in Herefordshire, an **Arctic Skua** (*Stercorarius parasiticus*) in Bedfordshire, a juvenile **Puffin** (*Fratercula arctica*) in Huntingdonshire and **Shags** (*Phalacrocorax aristotelis*) in Nottinghamshire.

Other rarities since mid-July have included a **Caspian Tern** (*Hydroprogne caspia*) at Llangorse Lake (Breconshire) on 20th July (there was also one in Suffolk in June), a first-summer **Ross's Gull** (*Rhodestethia rosea*) at St. Ives (Cornwall) from 26th July, one or two **White-winged Black Terns** (*Chlidonias leucopterus*) at Shellness and Stoke (Kent) between 29th July and 18th August, a **Little Egret** (*Egretta garzetta*) at Dale (Pembrokeshire) from 13th to at least 25th August, two **Cranes** (*Megalornis grus*) near Kemnay (Aberdeenshire) on 14th and 15th August and one at Cley on 8th September, and a **Gull-billed Tern** (*Gelochelidon nilotica*) at Gosford Bay, East Lothian on 16th September (as well as others on the south coast). Incidentally, Little Egrets appeared in the Isles of Scilly, Pembrokeshire, Hampshire, Kent and Norfolk in May and June, and another summer highlight was the occurrence of a female **Rock Thrush** (*Monticola saxatilis*) on St. Kilda on 17th June. Two days earlier there had been a Buff-breasted Sandpiper at the same place.

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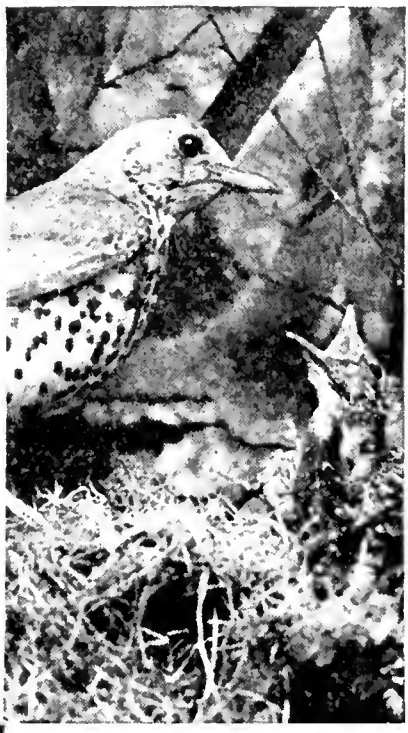

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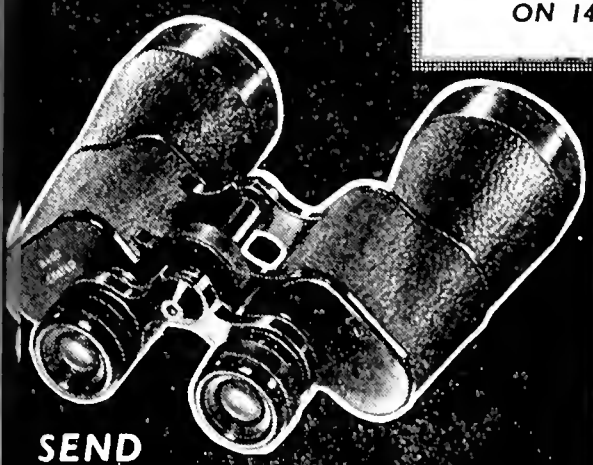

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Birds nesting in aircraft

By C. J. Bridgman

IN TWENTY-FOUR YEARS of continuous service in the Royal Air Force, throughout which time I have been engaged in maintenance, I have had particular opportunities to note the building of nests by birds in aircraft. It was not until 1956 that I first observed such an occurrence myself, but I know of earlier incidents in 1942-44, 1945 and 1946. I have spoken to a number of other long-service personnel and their impressions are that this practice has not only increased in the past decade but that it continues to do so. Though I may be biased by my growing interest in the subject, I would not hesitate to agree with this.

These records are not the result of a full-scale enquiry, but are derived from what I have seen myself and from information I have collected casually from other people. They can only cover, therefore, a small proportion of the nesting that has occurred in the period. They are being published now because my service with the Royal Air Force ended in October 1962.

NESTS AND SITES

Nests have been found at the time of building, with eggs, with young, and long after the birds have finished with them. The stage in the nesting cycle reached before discovery is mainly dependent on the serviceability of the aircraft concerned and its position on the airfield. When an aircraft is in a ready-for-flight state, nesting operations will normally be detected at an early stage, especially if the site chosen is in a vital area subject to frequent checking. On the other hand, if an aircraft is awaiting or undergoing repair or modification the birds may well succeed in hatching young, while in the case of one in storage the complete nesting cycle may even be achieved.

Table 1—Specifications and dimensions of aircraft mentioned in the text

Dimensions are given to the nearest foot. The numbers in brackets refer to the indivi records in the list on pages 463-469 and show those in which each aircraft was involved

Name	Specification	Engines	Wing-span	Length	Height	
Beverley	Medium-range freighter	4	162	100	38	(1)(2)(12)(13)(14)
Botha	Torpedo bomber					(11)
Canberra	Light bomber	2	64	66	16	(28)
Dakota	Medium-range transport	2	95	65	17	
Devon	Light transport	2	57	39	13	(21)
Hastings	Long-range transport	4	113	82	23	(9)(10)(15)(18)(19)(24)(27)(
Liberator	Bomber and transport	4	110	66		(16)(17)
Meteor	Single-seat fighter	2	37	44	14	(4)(5)
Mosquito	Light bomber	2	54	41	15	(8)
Oxford	Trainer	2	53	35	11	(6)
Pembroke	Utility transport and trainer	2	65	46	16	(20)(22)(23)(26)
Tempest	Single-seat fighter-bomber	1	41	34	16	(25)
Valetta	Medium-range transport	2	89	62	20	(7)
Varsity	General-purpose trainer	2	96	68	24	(3)

Nest sites vary. Nests have been found in engines, wings, control surfaces, fuselages and fins. Entry has usually been through some small access hole just sufficiently large for the species concerned. Most such openings lead to enclosed areas with little light. More access holes are available on a large aircraft than on a small one, and there are more suitable sites on a heavy, slow freight transport than on a fast, streamlined one or on a bomber. Nests have been found in aircraft of thirteen types and Table 1 is designed to give some indication of the sizes and shapes of these, as well as to show the number of records for each.

It is usually quite difficult to reach a nest to remove it, and much work is involved in removing access panels or whole sub-assemblies. Nests therefore have a great nuisance value, but, what is more important, some nests have been built adjacent to vital control mechanisms and could have been hazards to aircraft safety. Whilst there is no record, as far as I can ascertain, of an aircraft accident attributed to a bird's nest, the utmost vigilance has to be maintained to ensure that no nest remains undetected. Servicing methods are such that nests in vital areas are most unlikely to be overlooked. Such areas are subject to frequent inspection when the aircraft is in a flight-readiness state.

It should be added that commercial aircraft are rarely allowed to stay on the ground for long whilst they are serviceable and at all times the aim is to get them flying and earning their keep; birds will therefore have fewer opportunities to build in them than in service aircraft.

RECORDED NESTS AND ATTEMPTS AT NESTING

Eight species are known to have nested in aircraft—Jackdaw (*Corvus monedula*), Blackbird (*Turdus merula*), Pied Wheatear (*Oenanthe leucomela*), Robin (*Erithacus rubecula*), Pied Wagtail (*Motacilla alba*), Starling

(*Sturnus vulgaris*), Grackle (*Gracula religiosa*) and House Sparrow (*Passer domesticus*). Additional species may have been involved in three of five cases where the birds concerned were not identified. All the nests I have seen or heard of are itemised below; those where no name is given are personal observations. The entries under each species are arranged chronologically. It should be noted that some records cover more than one nest: generally speaking, all the nests in any one aircraft are dealt with in the same paragraph.

Jackdaw (*Corvus monedula*)

(1) A Jackdaw's hoard was found in the tail heater duct of a Beverley undergoing repairs in a hangar at Shawbury, Shropshire, in the spring of 1959 (the Beverley's many apertures make favourite nesting sites). Sixty-two metallic objects had been collected by a pair of Jackdaws from engine docks around the engines and placed in the heater duct between a Thursday evening and the following Monday morning. The objects were all aircraft parts and tools, the heaviest item being a spanner weighing 1½ ounces. The hoard was discovered when one of the birds was seen to drop an article on the Monday morning.

(2) In August 1961 the ailerons of a Beverley at Abingdon, Berkshire, were removed and one nest was found in each of its port and starboard wing-tips. The nests were made of fairly thick sticks and pieces of rubberised horsehair. One had a few small pieces of eggshell in it and these were recognised as a Jackdaw's (Corporal R. Jeffers).

Blackbird (*Turdus merula*)

(3) A Varsity was standing in a hangar at Watton, Norfolk, for a considerable time during the spring of 1960. A Blackbird built two nests in the port engine, starting on the second as soon as the first was pulled out. When the second suffered the same fate it began on a third, this time in the starboard engine. This nest was removed immediately before Whitsun (4th-6th June) and the birds made use of the holiday to build yet another in the port engine; by the time work was resumed on 7th June this fourth nest contained one egg. As the aircraft was to be unserviceable for a considerable time, it was decided at that point that persistence should have its reward and the birds were allowed to raise their brood. Three eggs were laid and hatched, but only two young fledged, the other being found dead outside the nest (Sergeant K. N. Wilson).

Pied Wheatear (*Oenanthe leucomela*)

(4) Nests of the subspecies *cypriaca* were found in four aircraft at Nicosia, Cyprus, during 1957. Two of the aircraft were parked on a

concrete apron outside inspection and repair hangars. Men were moving about throughout the day in varying numbers, some of them working on other aircraft standing on the apron. Run-ups of jet and piston-engined aircraft on the apron were quite common. The first nest was in the port mainplane of a damaged Meteor. The aileron had been removed and the birds had access to the interior of the mainplane through the aileron control rod aperture. The nest was approximately one foot from the entrance and against the rear skin of the mainplane. It was made of the usual coarse plant stems, with the addition of little pieces of wood, cotton and fabric of a kind used on aircraft. There were five eggs when it was discovered on 20th April 1957 and five young hatched out on the 29th. The aircraft was scrapped on 2nd May, the mainplane removed to the other side of the airfield and the young lost. The female started to build in the nose of the aircraft on 6th May, but the fuselage was taken away the same day. The female then built in a cave some thirty yards away on 7th-8th May and eventually four young successfully fledged (P. C. Clarke and C.J.B.).

(5) The second *cypriaca* nest at Nicosia was built in the starboard tailplane of another Meteor awaiting repairs. The tail cone had been removed and the female entered at this point, beginning to build on 20th April 1957 and using the normal materials. The nest was soon abandoned, however, when work started on the aircraft (P. C. Clarke and C.J.B.).

(6) The third nest, containing four eggs, was found on 6th May 1957 in the port mainplane stub of a derelict Oxford on an out-of-the-way part of Nicosia airfield (Flight-Sergeant R. Legge).

(7) The fourth nest at Nicosia was found in a Valetta on 4th June 1957. It was on a spring-loaded flap on the underside of the port wing, between the mainplane and the aileron. Removed upon discovery, it contained four fresh eggs. In the period when nest-building and egg-laying must have been taking place, the aircraft had been on short local training flights during the daytime, returning to the same parking bay after each flight (Warrant Officer A. Ward).

Robin (*Erithacus rubecula*)

(8) In March 1953 a Robin's nest was found inside the engine cowlings of a Mosquito at Aston Down, Gloucestershire. It was possible to leave the nest until the young were old enough to depart of their own accord (Corporal W. J. Hill).

Pied Wagtail (*Motacilla alba*)

(9) A Pied Wagtail started to build a nest between two cylinders of the port inner engine of a Hastings at Colerne, Wiltshire, in the

last week of April 1962. The aircraft was undergoing servicing and was standing in an open-ended hangar. The birds had probably been building for two days and had made a lot of progress with the nest when it was removed because the aircraft was due to fly (Sergeant B. McCleary and others).

(10) At 14.30 hours on 27th June 1962, again at Colerne, I saw a pair of Pied Wagtails fly to the starboard outer engine of a Hastings parked on a concrete strip about 200 yards from the hangar referred to in the last incident. The aircraft had been parked on the spot after returning from a flight in the middle of the previous day. The female was carrying nesting material into the engine after alighting on the propeller spinner. The male accompanied her in flight, but usually staying outside on the top of the engine cowlings. On two occasions, however, he entered the engine with token pieces of dried grass cuttings. The female paid seven visits to the site within ten minutes, carrying material each time. Both then moved away. As the aircraft was due to fly early the next morning the engine was examined at 23.00 hours, but very little nesting material was found and it seemed that the birds had made little effort other than when I was observing them.

Starling (*Sturnus vulgaris*)

(11) Starlings' nests were removed from rudders and flaps of Bothas in Britain in 1942-44 (W. Anstead).

(12) In April 1956 Corporal J. W. Hill was checking the port flap jack in the mainplane of a Beverley at Abingdon, Berkshire. On thrusting his arm through the access aperture—normally covered by a panel—he placed his hand on a Starling sitting on its eggs, the number of which he does not remember. He removed bird, eggs and nest.

(13) During the evening of 26th April 1962 I saw a Starling carry nesting material into the hot air vent in the starboard wing-tip of a Beverley undergoing extensive overhaul and repairs in a hangar at Dishforth, Yorkshire. On the afternoon of 8th May Starlings were still using the hot air vents, one in each wing-tip, and so both were stopped with cloth pushed hard in. Later the same afternoon one of the birds was seen to remove the cloth from the port wing-tip in the course of an hour's hard work. What it did, in fact, was to remove two pieces of cloth—one a yard square and the other a foot square—from a hole about four inches in diameter. I checked the aircraft at 22.30 hours the following morning and saw that the birds with the nest in the starboard wing-tip had also pulled sufficient cloth out to enable them to enter under what remained in the vent. By 16.00 hours they had removed the cloth entirely and dropped it on the floor; it measured

approximately five feet by two. I also saw Starlings entering the starboard rear heater duct of the aircraft on this day. On 25th May the nests in the starboard wing-tip and the rear heater duct were still in use and the adults were carrying food to them. The port wing-tip had been denied to the birds, the entrance having been masked by stiff paper secured by adhesive tape. Starlings were also seen taking food into the central hinge point of the port rudder in the port fin, thus making the fourth known nest in this aircraft.

(14) A second Beverley in the same hangar as the one above was undergoing extensive repairs and refit at the same time. At an early date in the nesting season the wing-tip hot air vents and other known nesting sites had been covered by paper and taped. On 9th April 1962, however, one of the fitters told me that a Starling's nest containing five eggs had been removed from the top outer corner of the open starboard clam door at the rear of the fuselage. This nesting site and similar ones were then also masked with paper and taped.

On the same day we observed Starlings entering the starboard aileron at the first hinge point. This could have been dangerous as it is in the region of the aileron trim tab control. The next evening I saw the material removed from the aileron nest site. It consisted mainly of grass bents, but there were also leaves, feathers, torn envelopes and other paper—sufficient to fill a two-gallon bucket. The material was left overnight on the staging which had been used to reach the site and the following morning it was found that the birds had replaced most of it back in the nest. It is almost impossible to stop birds gaining access to such a site. On 28th May the wing-tips were removed from this aircraft to check whether any nesting material was in them. The port one was clear, but the starboard one contained a nest with two eggs. It was obvious, therefore, that the entry had not been stopped early enough in the season.

(15) Upwards of twenty incidents of Starlings trying to build nests in the top rudder hinge point in the fins of Hastings on the airfield at Colerne, Wiltshire, were noted during the 1962 nesting season, the last occasion being about 11th June.

Grackle (*Gracula religiosa*)

(16) Grackles were seen to build nests in the engines of Liberators at Jessore, eastern Bengal, in the years 1942-44 (Sergeant B. McCleary).

(17) They also built in the engines of Liberators at China Bay, Ceylon, in 1945. Dakotas were on the same airfields at the time of this incident and the previous one, but no nests were found in them. This species was very quick to start building, so fairly frequent checks were made and the nests were removed at an early stage (Sergeant B. McCleary).

House Sparrow (*Passer domesticus*)

(18) In the spring of 1956, at Nicosia, Cyprus, I saw a Palestinian House Sparrow (*P. d. biblicus*) carrying nest material into the fin of a Hastings, alongside the top rudder hinge bracket. To dissuade the birds from continuing to build, the aircraft was moved to a distant part of the concrete apron. When the nest was taken out, it was found to contain pieces of discarded locking wire besides the more normal material.

(19) Some three weeks after the above incident an airlift of troops to Nicosia occurred. As the Hastings transports arrived they were parked around the perimeter of the apron and, well after nightfall, the last one of all was parked on approximately the site of the previous nesting attempt. The following morning, an hour or so after dawn, I saw Palestinian House Sparrows carrying nesting material to the same place on this aircraft as on the previous one.

(20) In 1957 a Pembroke, which was awaiting major repairs, had been standing for some weeks on the same busy apron outside the inspection and repair hangars at Nicosia when I located two more nests of the Palestinian House Sparrow. The first, in the port mainplane, was found on 30th May. The hen bird, perched on the aileron control rod, was feeding her young at the aperture where the rod leaves the mainplane. When the nearest access panel was removed the young dispersed within the mainplane and could not be reached. The adult birds continued feeding the young as soon as the men moved away from the aircraft. The second nest was discovered on 4th June, this time in the starboard mainplane. This nest was also disclosed by the adult birds perching on the control rod to feed their young through the rod exit aperture. Both pairs of birds were allowed to rear their young, this being thought the surest way of removing them (short of pulling the mainplane apart). The nests, when examined, were poor things made of wild oat straw, but thick material would not be so necessary in this case as it was exceedingly warm within the metal mainplanes out in the sun.

(21) In 1957 and 1958 House Sparrows built in the air intakes of the engine oil coolers of a Devon at Fontainbleau, France, on at least three separate occasions. The nesting material was removed as soon as building was observed, but the birds were so persistent that the entrances to the air intakes had to be blanked off whenever practicable while the aircraft was on the ground (Flight-Sergeant A. C. Elphick).

(22) In both these years this species also built in the wings of a Pembroke at Fontainbleu, using the exit aperture of the aileron control to effect entry. There was only one nest at any one time. No nest was left in either Devon or Pembroke long enough to contain eggs (Flight-Sergeant A. C. Elphick).

(23) In 1960 Palestinian House Sparrows attempted to nest in the port mainplane of a Pembroke of the Station Communications Flight at Nicosia. This aircraft was a mile or so distant from the one of 1957 discussed under (20) above. The nest was discovered when the birds were seen entering, again through the aileron control rod aperture. They persisted in their efforts even when nesting materials were, with difficulty, removed several times. One of the birds is thought to have flown with the aircraft on one occasion as it was seen to leave the wing of the aircraft as it taxied in after a flight (Corporal-Technician N. A. Piggott).

(24) On the morning of 5th April 1962 a House Sparrow was seen to enter and leave the starboard fin of a Hastings, via the side of the rudder top hinge bracket, in a busy hangar at Dishforth, Yorkshire. All probable entrance holes for birds in this and other aircraft in the hangar were sealed with paper and tape immediately after this incident. The aircraft concerned was checked at a later date and no nest material was found in the fin (Flight-Sergeant A. J. Farquharson).

Species uncertain

(25) During 1945-47 nests were frequently built in Tempests while they were being assembled at Karachi, India. The assembly was started at one end of a hangar and the completed aircraft was pushed out at the other. Sometimes the nests remained undetected until eggs or even young were present, and it was rarely that the birds were noted in the act of building (Warrant Officer F. Oakshott).

(26) At Habbaniyah, Iraq, in February and March 1957, two species built in a Pembroke undergoing repairs in a busy hangar. One was thought to be the local House Sparrow; the other, larger, was unknown to the observer. Several nests were found and some of the birds managed to hatch their eggs before discovery. Nesting in aircraft became so common at Habbaniyah that a local order was issued that all likely bird ingress holes were to be blocked whilst aircraft were not flying (Flight-Sergeant A. J. Farquharson).

(27) The following is a note from my diary for 25th April 1958, when I was in Nicosia, Cyprus. "Transport Servicing Flight had to remove a nest from the top hinge bracket point (in rudder) of the fin of a Hastings about a month ago. No further details available." It is most probable that this nest, like those under (18), (19), (20) and (23), was built by Palestinian House Sparrows.

(28) A Canberra was being serviced after modification in a busy hangar at Colerne, Wiltshire, when a nest was found on top of the starboard tailplane root inside the fuselage. It was shown to me on 10th May 1961, the day after it was discovered. The greater part of

The material consisted of old dead stems which I later found to be the remains of the previous year's chrysanthemums, but I also came across a short piece of nylon such as had been used in the embodiment of the modifications; the cut ends of this were quite fresh, proving to me that the nest had been built recently in that hangar. Why was the nest building missed in such a busy place? I was frequently near the aircraft, but had never seen birds enter it, and a number of other airmen looked for bird activity that might be of interest to me. Some of us had noticed that House Sparrows had attempted to build in the works of two gantries in the hangar and that nesting material had been dislodged when the gantries were used. On one or two occasions I had seen the birds with nesting material on the gantries. I believe the aircraft nest also to have been the work of House Sparrows as no other species was frequenting the hangar at the time.

(29) About 25th October 1961 a Hastings being serviced at Colerne was found to have a nest against the top hinge bracket point (rudder) in the fin. It consisted of hay and feathers and was probably either a Starling's or a House Sparrow's (Senior-Technician A. Prowell).

DISCUSSION

It will have been noted that in many cases there is little of the history of the nests concerned. This is because most of the observers do not confess to have much, if any, interest in natural history, but they do remember untoward incidents which involve them in unusual work. Once a nest is discovered they have to ensure that it is removed and this is often no easy matter.

It has been shown that Jackdaws and Starlings will use similar sites in Beverleys, and that Starlings and House Sparrows will take over similar positions in Hastings transports, but there is no record of competition and, in fact, it has not been known for two different species to use similar sites on the same airfield. In 1962, when Starlings built in Beverleys in a hangar at Dishforth, both Jackdaws and Starlings were building in the surrounding roof beams and walls. It is probable that there were sufficient nesting sites for the local population of Jackdaws but not enough for the Starlings. Hence the Starlings used the Beverley sites without opposition from the Jackdaws.

The Grackle and the House Sparrow are the only species recorded as having nested in aircraft in more than one country, the former in India and Ceylon, the latter in England, France, Cyprus and probably Italy.

Nests cannot be allowed to remain in an aircraft that is otherwise in a serviceable state and any airman who even suspects one has a duty to

report it. Investigation of the suspect area must then be carried out and any material found, even eggs or young, must be removed. A serviceable aircraft obviously cannot be kept on the ground until young birds fledge and rarely would eggs or young survive flights by aircraft. The Valetta in Cyprus carrying the eggs of the Pied Wheatear was making only local, low height, training flights.

Nesting in aircraft must obviously be discouraged at all times, but this is easier said than done. Birds are, on the whole, secretive when building and because they are most active in the early mornings (and they also have the evenings and week-ends) they stand a fair chance of remaining undetected. During laying and incubation less comings and goings are necessary and these can probably be effected in secrecy. The greatest risk of discovery is when there is a hungry brood to be fed and frequent visits to the nest must be made throughout the day.

SUMMARY

(1) Records of birds nesting in aircraft in England, France, Cyprus, Iraq, Pakistan, India and Ceylon are detailed.

(2) At least eight species have been involved—Jackdaw (*Corvus monedula*), Blackbird (*Turdus merula*), Pied Wheatear (*Oenanthe leucomela*), Robin (*Erithacus rubecula*), Pied Wagtail (*Motacilla alba*), Starling (*Sturnus vulgaris*), Grackle (*Gracula religiosa*) and House Sparrow (*Passer domesticus*).

(3) The Grackle and the House Sparrow are the only species known to have nested in aircraft in more than one country, the former in India and Ceylon, the latter in England, France, Cyprus and probably Iraq. Grackles have used similar sites in Liberators in India and Ceylon, and House Sparrows similar sites in Pembrokes in France and Cyprus.

(4) The oldest of the records given refer to the period 1942-44 and the majority have been since 1956. It is believed that nesting in aircraft is on the increase.

The Buzzard's versatility as a predator

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A STUDY OF THE FOOD of the Buzzard (*Buteo buteo*) was undertaken near the village of Wyszobórz in western Pomorze, Poland, from October 1958 to September 1959. Its object was to determine the influence of this species on a semi-wild population of Coypus (*Myocastor coypus*) bred for their fur. In the event the Buzzards took extremely few Coypus, but since our observations on food and feeding illustrate the versatility of these birds as predators, it is thought that the study is of more than local interest.

The Coypu farm comprised a fenced area of 192 hectares (474 acres) mostly overgrown with sedges and reeds, but also having canals and a lake of 25 hectares (62 acres). The surrounding countryside was largely wooded, mostly with pines, but included some open ground varying from arid fields to marshy meadows according to the elevation. Three pairs of Buzzards regularly frequented the farm in autumn and winter, but in the breeding season they hunted mostly in the fields outside, where the vegetation was short, and they nested in the woods.

During the period of our researches the Coypu population varied from 1,000 to 1,800. Between the end of October and the end of December each year, the animals were caught and transferred to large, specially prepared pens in which they stayed until early April, being fed on oats. This food attracted other creatures: for example, large flocks of Yellowhammers (*Emberiza citrinella*) and Corn Buntings (*E. calandra*) remained in the area all winter. From late April to September the Coypus lived free all over the farm and were not given additional food.

Because of the differences in the living conditions of the Coypus, and because the Buzzards regularly frequented the actual farm only in autumn and winter, the study was divided into two periods—the first from October to early April and the second from late April to September. Data on the food of the Buzzards were obtained by the following methods:

(1) Analysis of pellets. These were collected from under trees or by fence posts on which Buzzards had been seen sitting.

(2) Watching hunting Buzzards by telescope (×40). The places where the birds hunted or perched, the numbers of successful and unsuccessful pounces and the weather conditions were all noted.

(3) Analysis of food brought to the nest. A box with a sloping net bottom was placed over one nest so that the food dropped by the parents rolled down the net into a bag (see Czarnecki and Foksowicz 1954, Wilusz 1958). The contents of the bag were examined three times a day, between 7 and 8 a.m., between 1 and 2 p.m., and between 7 and 8 p.m. After examination, identification and weighing, the prey was given to the young.

FOOD RECORDED

Autumn and winter

A total of 51 Buzzard pellets were collected on the farm and 74 prey items were identified from the bones and hair found in them. These are listed in Table 1. Common and Root Voles (*Microtus arvalis* and *M. ratticeps*) provided a large proportion of the prey identified (20% each by frequency of occurrence) and other species of small rodents and insectivores made up most of the remainder. It should be noted that

the remains of only one Coypu were identified. The occurrence of the Pine Vole (*Pitymys subterraneus*) is interesting because, according to Brink (1956), the northern boundary of its range lies to the south of the study area.

A total of 39 hours in November and December 1958 and January 1959 was spent watching how and where the Buzzards hunted. Fifty-eight attempts to catch prey were noted, but only five of these were successful, the victims being four small mammals and one small bird. The Buzzards modified their hunting according to the availability of food, which, in turn, was much dependent on the weather. Early in the winter they still hunted more in the adjacent fields where the vegetation was short than on the farm where it was high, but they quickly exploited a temporary source of food when the farm was flooded and islands of higher ground were crowded with small mammals. Again, when there was deep snow they preyed almost exclusively on the small birds which gathered at the Coypu pens. In attacking the flocks of Yellowhammers there, they depended on surprise and appeared suddenly from behind stacks of straw after watching from an adjacent fence.

Coypus feeding in the vicinity on these occasions paid no attention to the Buzzards, which suggests that they did not fear them as predators. Indeed, we saw no actual attacks on Coypus and have only one clear record of a presumed kill, a Buzzard once being flushed from a freshly dead Coypu two or three months old; round about there were marks of a struggle in the snow. Viscera of young Coypus were twice found on fence posts where Buzzards were in the habit of sitting, but this is not conclusive. All other instances were of Buzzards flushed from Coypu carrion and it may reasonably be supposed that Coypu remains in Buzzard pellets during winter are usually derived from carrion.

Table 1—Prey identified in analysis of 51 pellets of the Buzzard (*Buteo buteo*), Poland, 1958-59

RODENTIA	No.	INSECTIVORA	No.
Common Vole (*Microtus arvalis*)	15	Mole (*Talpa europaea*)	3
Root Vole (*Microtus ratticeps*)	15	Common Shrew (*Sorex araneus*)	5
Field Vole (*Microtus agrestis*)	3	Pygmy Shrew (*Sorex minutus*)	3
Voles (*Microtus* sp.)	2	Water Shrew (*Neomys fodiens*)	2
Pine Vole (*Pitymys subterraneus*)	1		
Bank Vole (*Clethrionomys glareolus*)	1	AVES	
Harvest Mouse (*Micromys minutus*)	1	Unidentified small birds	2
House Mouse (*Mus musculus*)	1		
Coypu (*Myocastor coypus*)	1	AMPHIBIA	
Hare (*Lepus europaeus*)	4	Mud Frog (*Pelobates fuscus*)	1
Unidentified small rodents	3	Frogs (*Rana* sp.)	6

Total 69

Spring and summer

As already stated, three pairs of Buzzards nested in the region surrounding the farm, one close by. On 18th June 1959 the device described earlier was fixed over the nest situated nearest to the farm, so as to catch the food brought by the parents to their single three-week-old nestling. The adult birds brought food to the nest every day from 18th June to 21st July. The total number of prey items collected during this time was 119, of which 108 were specifically identified. These are detailed in Table 2. The most frequent species was easily the Common Vole (80% of all prey identified) and Moles (*Talpa europaea*) were the second most numerous (12%).

No less than 56% of the total number of prey items were brought to the nest between dawn and our 7-8 a.m. visit, 27% between that and 1-2 p.m., and only 17% in the remainder of the day; the greatest numbers of both Common Voles and Moles were taken in the morning. Of the Common Voles brought to the nest, 63% were males and 36.5% females.

Because they were hunting mostly in fields outside the farm at this time, the Buzzards took no Coypus in the breeding season.

Table 2 – Prey brought by a pair of Buzzards (*Buteo buteo*) to their single nestling, Poland, 18th June to 21st July 1959

Rodentia	No.	Insectivora	No.
Common Vole (*Microtus arvalis*)	88	Mole (*Talpa europaea*)	14
Root Vole (*Microtus ratticeps*)	2		
Voles (*Microtus* sp.)	7		
House Mouse (*Mus musculus*)	1		
Yellow-necked Mouse (*Apodemus flavicollis*)	1	Aves	
Vole Rat (*Arvicola terrestris*)	1	Song Thrush (*Turdus philomelos*)	1
Unidentified small rodents	2	Lark (*Alauda* or *Lullula*)	1
		Duck (Anatidae)	1

Total 119

DISCUSSION

The diet of the Buzzard, particularly during the nesting season, has now been studied in many parts of its range (Czarnecki and Foksowicz 1954, Folitarek 1948, Hell and Sovis 1957, Melde 1956, Piechocki 1951-52, Toufar 1955, Uttendörfer 1939 and 1952, Zharkov and Teplov 1932, and many others). It is now clear that the most important food species in many localities of central Europe, and in parts of the U.S.S.R., is the Common Vole. It forms, on average, about 50% of the food and we have seen that at the present locality it made up as much as 80% of the prey brought to the nest. This is in direct contrast to parts of Britain where the Rabbit (*Oryctolagus cuniculus*) used to be the main food, so much so that when myxomatosis reduced the

numbers of Rabbits many Buzzards ceased to breed. However, even in Britain the Buzzard has long been a versatile feeder and by no means all pairs were affected in this way (Moore 1957).

Our study likewise demonstrates that the Buzzard is versatile in adapting its method of hunting to suit the available prey, the most unusual method we noted being the surprise attacks on flocks of Yellowhammers from behind stacks of straw. Other authors have recorded unusual prey in times of food shortage (e.g. Drost and Schüz 1940, Piechocki 1951-52).

Despite the Buzzard's versatility, however, its preferred food is clearly small mammals and in order to catch this prey, whether by pouncing from the air or by planing down from a look-out post, it needs countryside with vegetation that is not too high. Again, the size of the preferred food seems to lie between that of shrews and moles or rats, since Coypus, although numerous and concentrated in pens in winter, were, for the most part, not attacked. A young adult Coypu weighs four or five pounds.

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SUMMARY

(1) The food and feeding behaviour of three pairs of Buzzards (*Buteo buteo*) were studied from October 1958 to September 1959 on and around a farm in Poland where Coypus (*Myocastor coypus*) were bred for their fur.

(2) Data were obtained by analysis of pellets, by watching the birds hunting and by collecting and examining food brought to a nest.

(3) The food brought to the nestling Buzzard was typical of this species and consisted mainly of Common Voles (*Microtus arvalis*) and Moles (*Talpa europaea*).

(4) The food in the winter was more varied, but Common Voles and Root Voles (*Microtus ratticeps*) together made up two-fifths of the total.

(5) Young Coypus (perhaps two or three months old) were only very occasionally taken.

(6) The Buzzards modified their hunting to exploit temporary food sources. When the farm was flooded, they made the most of concentrations of smaller mammals on islands of higher ground. When there was a thick layer of snow, they attempted to surprise small birds by appearing suddenly from behind stacks of straw.

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Studies of less familiar birds

120. Great White Heron

Photographs by Eric Hosking

(Plates 72-79)

THE GREAT WHITE HERON (*Egretta alba*) is better named the Great Egret as this shows its true affinities and avoids confusion with *Ardea* (*herodias*) *occidentalis*, the Great White Heron of America. The Great Egret is a species about which the text books are frequently contradictory. In the course of an ornithological expedition to Hungary in 1961 Dr. Zoltán Tildy, Vice-President of the Hungarian Council for Nature Protection, kindly provided us with opportunities to study these birds at their breeding grounds on Lake Velence and at the Kisbalaton sanctuary.

Once numerous in Hungary, the Great Egret was almost exterminated by plume-hunters at the turn of the century. Between 1915 and 1930 there were few breeding records, but under strict protection a recovery took place until some forty pairs were nesting at Kisbalaton and five pairs at Lake Velence. By 1960, however, drainage of the

marshes around Lake Balaton had again reduced the total at Kisbalaton to eight pairs, though twelve pairs bred at Lake Velence that year. Our observations in 1961 suggested a slight improvement at both colonies.

Unlike most species of Ardeidae these birds are exceptionally shy. Their nests are widely scattered, each pair commanding a fairly extensive area of reeds with no other nest in sight. Both Hungarian colonies were in the centre of several thousand acres of *Phragmites* which rose to ten feet above water level (plate 79a). Although both Purple Herons (*Ardea purpurea*) and Herons (*A. cinerea*) were nesting in the reed-beds, none were tolerated close to the Great Egrets. The nests of the Great Egrets were huge constructions of *Phragmites* stems, built up to four or five feet above the water (plate 75). Additional stems up to six feet in length were constantly being added even when the young were in the nest. Food was chiefly fish, with occasional frogs.

Eric Hosking and George Shannon spent many days in hides (plate 79b) and reported that the adults were usually silent, though a deep *frawnk* was occasionally heard when the birds greeted each other at the nest. This was accompanied by a bowing motion with the neck extended and arched (plate 76) and the long scapular "cloak" raised. This cloak, which is made up of thirty to fifty plumes a foot to eighteen inches long and extends well beyond the tail, is well illustrated on plates 72 and 78. The plumage of both sexes at all ages from juvenile upwards is pure white. The males in the colony were recognisable by their slighter greater size and noticeably larger heads (plates 76 and 77a). Both sexes spent long periods standing motionless in the reeds adjacent to the nest, with long necks extended and only their snake-like heads visible (plates 73 and 74).

Bill colours are variable combinations of black and yellow (not pure yellow as stated in some text books). Most of the breeding birds studied in Hungary had black bills with yellow from the base to a little below the nostrils; a few showed more extensive yellow and one or two had completely yellow bills. The last were probably not breeding. In the opinion of Dr. Tildy, the amount of yellow seen in summer is an indication of age rather than breeding condition. The bare skin of the lores is pale green and the irides are straw-yellow. The colour of the legs is again a matter of contradiction in the text books, most of which describe them as black. All the breeding birds seen in Hungary had pinkish-yellow on the upper parts of the legs. This extended from the feathering of the thigh to the joint of the tarsus and continued in a diminishing stripe down either side of the tarsus, the front and back scutes being black (plates 73, 76 and 77). Dr. Tildy regards this colouring on the legs as the most reliable

PLATE 72. Great White Heron *Ardea occidentalis* preening, Hungary, June 1964. A tall and long-winged species with narrow wings spanning nearly five feet, looking larger because of its whiteness, this striking species sports a nuptial cloak of as many as thirty to fifty scapular plumes 12–18 inches long. pages 475–478. *Jean C. Dr. Hoyo*.

PLATES 73 and 74. Great White Herons *Egretta alba* at nest and standing in reeds, Hungary, June 1961. Note the attenuated shape, the long, thin and often kinked neck, and the narrow, snakelike head without a crest (page 477). The bill is black and yellow, the legs black and pinkish (plate 76) (photos: Lux, Hed wig

PLATE 75 (*below*). Nest of Great White Heron (*Egretta alba*), Hungary, June 1961. In this colony all the nests were huge structures of reed stems four or five feet above the water in *Phragmites* eight to ten feet high; the individual pairs were widely spaced (page 476). This is typical of the European form, but in America another race builds its nests closer to each other in trees

VII. 76 (above). Greeting ceremony of Great White Herons *Egr. a. alba* at , Hungary, June 1961: the larger-headed male has his neck arched out. Both s incubate the three or four pale blue eggs and feed the white-downed young, his nest on fish and frogs. At the change-over a deep *trumpe* was sometimes red, but generally the birds were silent. Note the scapular cloak extending beyond the tail. The upper legs are pinkish-orange in the breeding season owish at other times) and this colour extends in a narrowing stripe down the s of the otherwise black tarsi; the bill is often black with varying amounts ellow at the base; the lores are pale green (page 476) *photo: Dr. Hagen*

PLATE 79. Above, waterway among reeds on Lake Velence, Hungary, June 1961. Below, the hide from which the Great White Heron (*Egretta alba*) photos were taken. In Europe they are now confined to such large areas of Phragmites as are left in Austria, Hungary, the Balkans and south Russia (page 477) (*photos: Eric Hosking*)

indication of breeding condition. After breeding the legs revert to greenish-black, or dark greenish-grey, and the bill to yellow.

The largest European colony is on the Austrian Neusiedler See, where more than 200 pairs bred in 1961. An undetermined number is thought still to breed in Macedonia, and Stanley Cramp and I. J. Ferguson-Lees tell me that there are several colonies of thirty to fifty pairs in the Danube delta in Rumania. Presumably some nest at the mouth of the Volga, but none now breed in Bulgaria. Although the species is now so scarce in Europe, it nests in many other parts of the world. The breeding range of the nominate form extends eastward to Siberia and Japan, and other races nest in India and the rest of south-east Asia, Australia, New Zealand, Africa south of the equator, Madagascar, the United States and Central and South America—in fact, in almost all suitable regions south of about 40°N. The more northerly populations move south in winter. GUY MOUNTFORT

[A pure white egret the size of a common Heron (*Ardea cinerea*) might be expected to be easy enough to identify, but in fact the Great White Heron or Great Egret does at times cause some confusion. Of the other herons breeding in Europe which can appear white, neither the Cattle Egret (*Ardeola ibis*) nor the Squacco Heron (*A. ralloides*) are pure white all over; in addition, both are more squat and compact, and they do not have anything like the same length of leg and neck. These are points which are evident even when no convenient yardstick is available for size comparison or estimation.

Although there is still the size discrepancy, the Little Egret (*Egretta garzetta*) is sometimes taken for a Great White Heron. The proportions of the two species have a certain amount in common, but the Great White Heron is appreciably more elegant (some would call it more attenuated and scrawny), with thin body and long slender neck; also it has no crest. Particular attention should be paid to bill and leg colour. Any sign of yellow on the bill indicates a Great White Heron, while blackish legs with clear lemon-yellow feet show a bird to be a Little Egret.

Confusion has also sometimes been caused in this country by albinistic common Herons. The latter often tend to show some darker, greyish tinge on some parts of the plumage such as crown or flight feathers and, although there is little difference in measurements, the common Heron is the more substantial bird. To those who know both species there is something characteristic in the thin gaunt body, slender kinked neck and narrow head of the Great White Heron. Plates 73 and 74 show these typical features particularly well. Moreover, it seems more graceful, perhaps partly because it does not adopt such a hunched attitude, with head and neck sunk between the

shoulders, as the Heron often shows. In flight, too, it looks more slender and has rather narrower wings; its flight at times is remarkably buoyant.—P.A.D.H.]

Residues of seed-dressings in Pheasants' Eggs

By J. S. Ash

Game Research Association, Fordingbridge, Hants.

FOLLOWING VERY HEAVY LOSSES of game and other wild birds as a result of seed-dressings used on an agricultural and sporting estate of 3,000 acres at Tumby in Lincolnshire, there were reports of Pheasants (*Phasianus colchicus*) dying and of many nest desertions during the breeding season of 1961. This occurred again in 1962, so on 15th May two deserted clutches of eggs, each of which had been incubated for three or four days, were collected and submitted for analysis. De Witt (1955, 1956) and De Witt, Derby and Mangan (1955) showed that, under laboratory conditions, chlorinated hydrocarbon pesticides (and some others) have marked adverse effects on the reproduction of quail and Pheasants. They reported reductions in the number of chicks produced, and increases in the percentages of crippled and defective chicks, after minute quantities of these chemicals had been added to the diet of adult birds.

At this point it may be of interest to outline briefly the stages in the incident at Tumby prior to the present analysis, although this has already been, or is being, discussed elsewhere with supporting figures (Ash 1962; Cramp and Conder 1961; Cramp, Conder and Ash 1962 and in press):

1960. Heavy losses, particularly in the spring, were reported by gamekeepers.

1961. Over 6,000 dead birds of at least 18 species were accounted for in the spring. This figure included 159 Pheasants and, whereas earlier deaths were mainly cocks, hens predominated during the breeding season. Many nests were deserted; of those examined, all contained eggs which had been incubated for not less than 14 days. In the area in which there had been most deaths, the number of Pheasants' eggs which hatched in a sample of 740 was only 42%, well below normal; many of the chicks were small and weak, and 41 of them died within four days. In the autumn, on the other hand, only 32 birds of six species were found dead.

1962. In the spring 112 dead birds of eight species were recorded (Woodpigeons, *Columba palumbus*, were not counted and are excluded from this figure, but there were relatively few compared with the previous year). Of this total, 59 were

Pheasants; again cocks predominated at first, and hens in the breeding season. Pheasant nest desertions began earlier, after only three or four days of incubation; one hen was found dead on a nest containing seven unincubated eggs. Four deserted nests of Red-legged Partridges (*Alectoris rufa*) were also found. The hatchability of Pheasants' eggs was better (58% of 2,160 eggs), but this figure is still well below the normal. Many of the chicks were weak and very small, and 104 of them died within a fortnight. The analysis of dead adult birds again indicated the presence of various seed-dressing chemicals.

The results of the analysis of the Pheasants' eggs from the two clutches collected at Tumby in May 1962 showed that traces of mercury and benzene hexachloride (BHC) were present in the proportions of 0.15 and 0.04 parts per million respectively. Both these chemicals are constituents of commonly used seed-dressings. The BHC was in the form of lindane or the gamma isomer.

The full significance of this can only be judged when we know the results of trials, now being planned by the Game Research Association, on the effects on the hatchability of eggs laid by birds which have ingested these chemicals. At the present time it is known that birds have died through eating grain dressed with toxic chemicals, that many nests have been deserted and that some eggs have contained some of the chemicals used: on the face of this circumstantial evidence there would appear to be a connection between the various events. If it can now be proved that poor hatchability (possibly resulting in weakly chicks) or even the death of the female during the breeding season (possibly due to a delayed action effect of one or other of the seed-dressing chemicals) is caused by the ingestion of toxic chemicals (either directly or, in the case of a predatory bird, by eating a prey species which contains the poison), then it may also account for the recent decline and/or poor breeding success of several other species, notably the Sparrowhawk (*Accipiter nisus*) and Peregrine (*Falco peregrinus*) in Britain, and the Osprey (*Pandion haliaëtus*) in North America.

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Notes

Ross's Gull in Yorkshire.—Whilst walking along the south beach at Bridlington, Yorkshire, on 17th February 1962, B.R. saw an unfamiliar gull and eventually obtained close views, as a result of which he reported it confidently to H.O.B. as an adult Ross's Gull (*Rhodostethia rosea*) in winter plumage. It was seen briefly on the next day by H.O.B.; closely watched for about half-an-hour at ranges down to about 30 yards on the 19th by R. H. Appleby, Mr. and Mrs. J. A. Bailey and Mr. and Mrs. A. J. Wallis; and finally for a few minutes early on the 22nd by G. R. Bennett. The following description is based on the notes of all these observers:

Upper-parts: crown and sides of head white, with a dark mark behind the eye; nape greyish, with at times a slight indication of a ring at sides of neck; mantle to upper tail-coverts pearl grey; tail white; wings pearl grey, slightly darker than mantle, with broad white trailing edge on secondaries; outer web of second primary black, excepting at tip; when folded, primaries noticeably darker than mantle. *Under-parts:* tail to chin white, flushed pink, deepest on breast and belly (possibly due to differing light conditions), accounts of pink flush varied from "nil" (B.R.) to "breast to tail coverts" (J.A.B.) and "breast to tail" (H.O.B.); wings grey, several shades darker than upper surface. *Soft parts:* bill delicate and black; eye dark; legs and feet bright red.

A sewage outfall to the south of the harbour held a mixed flock of gulls: Black-headed (*Larus ridibundus*), Common (*L. canus*), Herring (*L. argentatus*) and Great Black-backed (*L. marinus*), with Kittiwakes (*Rissa tridactyla*) and Fulmars (*Fulmarus glacialis*) also present. The Ross's Gull was seen only in the general area of the outfall, the harbour entrance and the beach to the south, from which area it was often missing for long periods. For most of the total of ninety minutes'

observation it was on the wing, but it was seen to settle on the sea for a short time on three occasions, and three times on the sandy beach. The flight was graceful, buoyant and tern-like; both B.R. and H.O.B. saw a crazy, weaving spell of flying in the manner of Black-headed Gulls coming down to a roost, whilst G.R.B. noted its easy mastery of a strong wind on the 22nd.

On calmer days it fed by hovering and flying into the wind low over the sea, occasionally pattering with the feet and quickly picking food from the surface with the bill. It seemed to favour one particular stretch, turning down wind to return and cover it repeatedly in the way marsh terns (*Chlidonias*) do. In flight it ignored observers, coming to within 30 yards, but B.R. found it impossible to approach closer than about 80 yards when it settled on the beach. It was harried at times by Black-headed and Herring Gulls. J.A.B. once noted a single call-note, a soft high-pitched *kwa* or *kew*.

At about 500 yards range, using binoculars, it was possible to pick the bird out from other gulls by its small size, pale uniform upper-parts, pink under-parts and dark underwing. At closer range it was noticeably smaller than Black-headed Gulls, with slim body, small head and bill, long, slender and pointed wings, and wedge-shaped tail with centre feathers clearly protruding slightly. At rest on the sea, the primaries extended well beyond the tail. The legs and feet only showed up as red in the closest views, merely appearing dark otherwise. This appears to be the second Yorkshire, fourth British and six-teenth European record. H. O. BUNCE and BRENT RICHARDS

Juvenile Cuckoo apparently imitating Meadow Pipit's call.—On 3rd July 1962 I noticed two Cuckoos (*Cuculus canorus*) perching on the railway-line at Kilcoole, Co. Wicklow. One of these was a typical juvenile, while the other was larger and lacked the white patch on the nape. Each time I approached them they flew a few yards further down the line and perched on the rail again. After the third or fourth of these flights, I distinctly heard one of them produce a sound exactly like the *tissip* of a Meadow Pipit (*Anthus pratensis*); after a short interval, it repeated it. The larger of the two birds then flew away across the fenland to some distant trees. The juvenile repeated the call twice more, with a pause between, before following a minute or so later. The call was such a perfect rendering of a Meadow Pipit's that I might have been excused if I had started looking for a pipit. However, as I twice observed the Cuckoo open its bill at the moment of the call, and as there were no other birds anywhere near, there can be no doubt that it was the Cuckoo which made the noise. It should perhaps be added that the Meadow Pipit is the Cuckoo's chief fosterer in Ireland.

RAYMOND J. O'CONNOR

Barn Owl sunbathing.—At about 3 p.m. on 1st September 1952, near Kessingland, Suffolk, I was much surprised upon observing a Barn Owl (*Tyto alba*) sunbathing. The bird was lying on a small sunny patch of ground beneath a large tree. One wing was raised, fully exposing that side of the body to the warmth of the sunshine. There do not appear to be any previous records of Barn Owls sunbathing and it must surely be unusual in the case of such a nocturnal species.

HOWARD BENTHAM

Carrion Crows killing Kestrel.—On 27th July 1962, at Hilfield Park Reservoir, Hertfordshire, I watched three Carrion Crows (*Corvus corone*)—two adults and a juvenile—attack a female Kestrel (*Falco tinnunculus*). The adult crows had a nest and the falcon happened to settle in the same line of trees. The episode took place in the top of a tree and it was very difficult to see anything because of the leaves, but the fact remains that the Kestrel shortly fell to the ground and died within a few seconds, apparently of a broken neck.

On 2nd September 1962, at the same locality, I watched a solitary Carrion Crow make repeated attacks on a female Kestrel in flight. The chase continued over the reservoir and through surrounding trees for about ten minutes, during which time two more crows joined the original attacker. On several occasions the Kestrel was forced almost to the ground, but eventually she escaped by superior flight and manoeuvrability.

BRYAN L. SAGE

Fledgling Spotted Flycatcher ensnared by nest material.—I have a standard flycatcher nest-box in my garden at Knaresborough, Yorkshire, and Spotted Flycatchers (*Muscicapa striata*) use it each summer. This year, 1962, was no exception and a female was sitting on four eggs when I went away in June. Returning on a July evening, I found a fully grown fledgling hanging head downwards over the front edge of the box and flapping its wings. The nest was otherwise empty, so it seemed likely that the rest of the brood had got away earlier that day. The bird that remained was weak and exhausted, and it died as I took it into my hand. On examination I found that it was held firmly by one leg which, from the foot to the joint, was completely embedded in nest material. Long hairs and other fine strands were so tightly wound round it that it was fixed as if in a vice. When I pulled the nest to pieces and freed the leg, after much patient work, I found that both leg and foot were underdeveloped: the leg was a great deal thinner than the other one and the foot was small and cramped together. It would seem from this that the bird must have become entangled fairly soon after hatching. J. FAIRHURST

Linnets blinded by seeds of bur-marigold.—On 22nd September 1962, while ringing birds at Allscott, near Wellington, Shropshire, R. E. Simister and I trapped an adult female Linnet (*Carduelis cannabina*) which had recently been blinded in the left eye by a seed of the erect bur-marigold (*Bidens tripartita*). Two hooks of the seed were still stuck in the eye and we had some difficulty in extracting them. The bird was otherwise in good physical condition and, after ringing and release, flew away strongly without sign of its disability.

In the following month we trapped several more Linnets which had been similarly blinded and we found, by observation, that the birds were actually feeding on the bur-marigold. It seemed curious that they should expose themselves to such a source of danger, but perhaps the damage was done when there was a sudden disturbance and hasty flight.

JULIAN M. LANGFORD

Reviews

Birds and Woods. By W. B. Yapp. Oxford University Press, London, 1962. xii+308 pages; frontispiece, 12 monochrome photographs and 24 text-figures. 35s.

In the opening lines Dr. Yapp ascribes this book to two causes: the interest of the work, and an "exasperation at being unable to find in the books the answers to simple questions". A fortunate interest and a fortunate exasperation which have combined to provide us with an important book, wherein once and for all the imprecise categories of "abundant" and "scarce" are abandoned, and a determined effort is made to provide an objective measure of the frequency of occurrence of woodland birds. The reviewer found himself reading on and on, not merely with interest, but with eagerness.

In the chapter on methods of research (wherein the discussion of the underlying mathematical theory is wisely left to reference to the relevant papers) no claim is made that the systems employed are perfect, but Dr. Yapp does not ally himself with that school of ecologists who seek so long for the perfect method that they never make any actual measurements at all. His methods are defined and can be repeated, and at a time when the fauna of this country seems to be changing in such a horrifying manner the data in *Birds and Woods* cannot but be of great value. There is a chapter on the woodlands of Great Britain, brief but authoritative and clearly illustrated, and then the different woodlands of Britain and their bird populations are surveyed. The data are given as the number of "contacts" with each

species in a stated period of time; relative abundance is expressed on the basis of the number of contacts with any one species stated as a percentage of all contacts; and, sometimes, a percentage frequency gives the percentage of a defined number of "time quadrats" in which a species was encountered. A chapter is devoted to the problems of woodland succession. (It is a pity that plate I, an aerial view of deciduous woodland, has been printed "upside down", so that the convexities of the canopy appear at first sight as concavities.)

The three chapters on the "Inter-relations of the Community" come, it must be admitted, as a disappointment—a disappointment due partly to the high standard of factual statement to which Dr. Yapp has accustomed his readers, and partly to the fact that in the realm of avian feeding ecology, at least, we are still at the horn-book stage. In the survey chapters the reader has been advancing in knowledge all the time; in the inter-relation chapters he will not quarrel with the generalisations presented, but he may not find them stimulating. In a brief discussion of density-dependence it is surprising to find that the increase of the Pied Flycatcher in the Forest of Dean after the provision of nesting-boxes is regarded as having "nothing to do with density dependent factors".

In a chapter on problems of distribution there is some bold but extremely reasonable speculation on the influence of climatic and edaphic factors upon the occurrence of certain species.

Nearly a quarter of the book is given to a "Systematic List" wherein the birds associated with woodlands are surveyed species by species. Dr. Yapp does not hesitate to disagree with other ornithologists when he considers that their data do not warrant their conclusions; and this is very stimulating. But *is* a Heron really to be described as a bird of the "tree-water ecotone"? It is found on trees, it is found in water, but is it necessarily found where trees and water meet?

There is a carefully prepared index, and a valuable bibliography. This is a "big" book—not big in size, but big in scope and broad in treatment. No future worker on woodland birds is going to be able to neglect it as a standard of comparison, as a basis for speculation or as a source of inspiration. P. H. T. HARTLEY

Die Brutvögel der Schweiz. Edited by U. N. Glutz von Blotzheim. Verlag Aargauer Tagblatt, Aarau, 1962. 648 pages; 54 photographic illustrations; 26 maps and diagrams. No price given.

This finely produced work on the breeding birds of Switzerland is written mainly in German, though some sections are in French. It is a result of the collaboration of some 56 Swiss ornithologists and is

designed not only to furnish the reader with all the existing information on the subject but also to act as a spur to further investigations which, it is hoped, will "soon make it out of date", though one must doubt that this can happen very quickly.

The book begins with a general section which deals in detail with the methods used by field ornithologists in studying breeding birds, with the geography and climate of Switzerland and with its vegetation. This section covers 148 pages and is illustrated by photographs of habitats and by a remarkable aerial panorama covering the whole of the country.

The rest of the book is devoted to the separate species, including those which bred in the past but do not do so now and those whose nesting must be regarded as doubtful. Species are, in general, treated under the following headings: distribution; habitat; population density, including population changes; feeding, including methods of feeding and food; reproduction, including nest-site, building of nest, beginning of laying, size of clutch, breeding results, number of broods, duration of breeding season, and incubation and fledging periods; and migrations, including arrival, departure and wintering. In a number of cases there is also a final section of remarks and suggestions indicating deficiencies in existing information about the species and ways in which these can be remedied. Breeding and other data are, on the main, based on Swiss experience, but a wide range of sources has been consulted and full references are given. It will be noted that plumage details, song and display are not regarded as coming within the sphere of the work. Each species is treated by the ornithologist who, presumably, knows it best. In 14 cases distribution maps are given.

The following breeding species have been gained during the present century. The Black-necked Grebe (*Podiceps nigricollis*) has nested for at least 30 years and is extending its range. The Purple Heron (*Ardea purpurea*) has established itself since 1941, though apparently only in one area. About two pairs of Gadwall (*Anas strepera*) have bred annually since 1959 and numbers on passage and in winter have increased considerably. The Shoveler (*Spatula clypeata*) was first proved to breed in 1917 and about six pairs now do so regularly. The Red-crested Pochard (*Netta rufina*) was first proved to breed in 1919 and 36 pairs are known to have done so in 1952; there has also been a great increase in numbers on autumn passage, thousands of birds being involved. Pochard (*Aythya ferina*), Tufted Duck (*A. fuligula*) and Goldeneye (*Bucephala clangula*) have all nested once or more in recent years, but have not apparently become established. The Collared Dove (*Streptopelia decaocto*) was first recorded in 1948 and probably nested about 1950 though breeding was not positively con-

firmed until 1955; since then expansion has been rapid and is still continuing. The Fieldfare (*Turdus pilaris*) first nested in 1923 and has since colonised much of the country; it is still extending its range westwards. Savi's Warbler (*Locustella luscinioides*) was first recorded in recent years in 1943; singing males have since been regularly noted, but breeding has been proved only once, in 1956. The Sedge Warbler (*Acrocephalus schoenobaenus*) has also been found nesting only once, as long ago as 1903. The first record of the Melodious Warbler (*Hippolais polyglotta*) was in 1948; breeding was proved in 1960 when the species was found to be well established in certain areas south of the Alps. The Barred Warbler (*Sylvia nisoria*) is known to have nested once, in 1952; this species has been recorded on passage only nine times during the last 90 years. The Collared Flycatcher (*Muscicapa albicollis*) was not found breeding between 1835 and 1949, but it now nests over a considerable area. The first real evidence of the nesting of the Penduline Tit (*Remiz pendulinus*) was obtained in 1952 and sporadic and irregular breeding has occurred since.

The list of birds which have been lost during this same period is fortunately much shorter and comprises only the White Stork (*Ciconia ciconia*) which has not nested since 1950, the Osprey (*Pandion haliaëtus*) which has not done so for some 50 years, the Redshank (*Tringa totanus*) which was last recorded breeding in about 1930, the Short-eared Owl (*Asio flammeus*) which is not known to have nested since 1939 and the Bluethroat (*Cyanosylvia svecica*) which has not been proved to nest for some 30 years. All these birds, except the White Stork, were only known to breed in very small numbers and all still occur regularly on passage. It seems probable, however, that the Crested Lark (*Galerida cristata*) has also ceased to breed, the last record being for 1959. This species appears to have colonised Switzerland during the second half of the 19th century and to have been most numerous during the first 20 years of the present one. The decline set in towards the end of the 1930s and is attributed to the many cold winters, the disappearance of the horse and the chemical destruction of weeds at railway yards.

A number of species have become commoner or more widespread since 1900. Great Crested Grebes (*Podiceps cristatus*) have greatly increased over the past 40-50 years. Protection has improved the position of the Heron (*Ardea cinerea*) over the past 30 years, though numbers are still apparently less than in the last century. The Little Bittern (*Ixobrychus minutus*) has both increased in numbers and extended its range. The Mute Swan (*Cygnus olor*), originally introduced, is steadily growing in numbers. The Golden Eagle (*Aquila chrysaëtos*) seems to have increased somewhat and 40-50 pairs now nest. The Coot (*Fulica atra*) has increased considerably and appears to be still extending its range. The Lapwing (*Vanellus vanellus*) was decreasing

until the 1930s, since when the population has recovered to about 366 pairs. Both the Black-headed Gull (*Larus ridibundus*) and the Common Tern (*Sterna hirundo*) have increased as a result of protection. The Turtle Dove (*Streptopelia turtur*) has become much commoner in some localities. Since the end of the 1940s the Black Woodpecker (*Dryocopus martius*) seems to have been extending its range. The Great Reed Warbler (*Acrocephalus arundinaceus*), which began to colonise Switzerland about 1870, had occupied all suitable areas by 1920. The Pied Flycatcher (*Muscicapa hypoleuca*) has greatly increased both in numbers and range since about 1920. Corn and Ortolan Buntings (*Emberiza calandra* and *hortulana*) have both become commoner, the latter occupying new areas in the south-west since 1920. The Greenfinch (*Chloris chloris*) has increased in recent years and the Serin (*Serinus canarius*), which has been extending its range since the middle of the 19th century, is also still spreading. The Alpine Chough (*Pyrrhocorax graculus*) appears to be on the increase. The Raven (*Corvus corax*) has been expanding since 1950 and has reoccupied districts from which it had been absent for some years.

On the other hand, a good many species are stated to be declining. The Partridge (*Perdix perdix*), Quail (*Coturnix coturnix*) and Corncrake (*Crex crex*) have all decreased, apparently as a result of changed methods of agriculture. The Little Ringed Plover (*Charadrius dubius*) has decreased greatly since the beginning of the century owing to destruction of nesting sites by dredging and the building of dams, and similar factors have led to a decline in the numbers of Snipe (*Gallinago gallinago*). Habitat destruction has also greatly affected the numbers of both the Curlew (*Numenius arquata*) and the Common Sandpiper (*Tringa hypoleucos*), and only about 20 pairs of the former now nest. The Eagle Owl (*Bubo bubo*) is becoming scarcer and scarcer despite protection, so much so that its eventual extinction is feared; at present the main threat is from the growing number of aerial cables in the mountains. The Little Owl (*Athene noctua*) has also decreased, largely as a result of improved forestry and the destruction of old trees. Kingfishers (*Alcedo atthis*) have suffered from losses of both nesting sites and food supplies, and only a few pairs now breed. The disappearance of old fruit trees has similarly led to a decline in the numbers of Lesser Spotted Woodpeckers (*Dendrocopos minor*). Swallows (*Hirundo rustica*) and House Martins (*Delichon urbica*) continue to decrease despite fluctuations. Red-backed, Lesser Grey and Great Grey Shrikes (*Lanius cristatus, minor* and *excubitor*) all appear to have decreased, perhaps as a result of the clearance of trees and bushes. The Stonechat (*Saxicola torquata*) seems to be less widespread than formerly. The Blue Rock Thrush (*Monticola solitarius*) has declined and is now only a sporadic breeder in the south. The Orphean

Warbler (*Sylvia hortensis*) has declined since the first quarter of the century and now nests only irregularly. The Linnet (*Carduelis cannabina*) has decreased greatly in some areas as a result of agricultural improvements. The Chough (*Pyrrhocorax pyrrhocorax*) was formerly commoner and more widely distributed than it is at present, but its numbers seem to have remained stable over the past 10-15 years.

Those who are contemplating visiting Switzerland in search of the typical Alpine birds will be glad to learn that all those not mentioned above are, on the whole, apparently maintaining their numbers. Species which nest at high altitudes are naturally less subject to disturbance from human activities though, on the other hand, their exact status may be less easy to determine. The Alpine Accentor (*Prunella collaris*), for example, may have ceased to breed in the Jura, though this is not certain; incidentally, little is known of the breeding biology of this bird. Interesting data about the Alpine Swift (*Apus melba*) are given; in 1959-60 at least 800 pairs nested in buildings, the largest colony being of 156 pairs, while up to 25 pairs nested in cliffs.

This is a most valuable work, not only for those interested in questions relating to ecology, breeding biology and distribution, but also for the casual ornithological visitor to Switzerland. Those involved are to be congratulated on its production.

D. D. HARBER

Våra Fåglar i Norden (Our Birds in the North). Second edition edited by Kai Curry-Lindahl (Swedish text). Bokförlaget Natur och Cultur, Stockholm, 1961. Volume III, 503 pages; coloured and black-and-white plates, and maps. (Four volumes: Sw. Kr. 430.)

Swedish ornithologists will not be alone in finding the third volume of the revised edition of *Våra Fåglar i Norden* as informative and useful as its predecessors (reviewed in *Brit. Birds*, 54: 74-78). The whole work follows the Wetmore order and this volume covers the skuas, gulls, terns, auks, pigeons, cuckoos, owls, nightjars, swifts, kingfishers, bee-eaters, rollers, hoopoes, woodpeckers, larks, swallows and martins—64 species and races in all.

Again Dr. Curry-Lindahl and his associates have to report losses and gains in the Swedish avifauna. A marked alteration in climatic conditions has led to the disappearance of the Roller (*Coracias garrulus*) from all but one of its Swedish haunts, and has perhaps banished the Hoopoe (*Upupa epops*), last known to breed there in 1954. Black Terns (*Chlidonias niger*), too, are neither as common nor as widely distributed as they were at the beginning of the century. From the

west coast come disturbing reports of the Black Guillemot (*Cepphus grylle*), some of the colonies being greatly reduced in numbers and others, in the Skagerrak, even totally deserted. Here the species is represented by the western race, *atlantis*; Baltic colonies—all populated by the nominate race—have meanwhile maintained their strength. Birds that rely on rotting and hollow trees for nesting-sites have all become scarcer where modern methods of forestry are practised. The Three-toed Woodpecker (*Picoides tridactylus*), in particular, seems to have been seriously affected by the clearance of unsound timber, and in some "improved" woodlands there is little to be seen of the Stock Dove (*Columba oenas*), a species which, however, has appeared and multiplied elsewhere. The Grey-headed Woodpecker (*Picus canus*) is being ousted in many places by the Green Woodpecker (*P. viridis*), but is actually increasing in parts of Jämtland not yet colonised by the stronger bird. Local ornithologists take a despondent view of the outlook for the Middle Spotted Woodpecker (*Dendrocopos medius*) with its preference for old, tall, deciduous woods. Every effort is being made to save the Eagle Owl (*Bubo bubo*), even to the extent of restocking some deserted strongholds; there are now estimated to be over 300 pairs of these fine owls distributed over the country, the majority in Norrland. Recent winter movements of the Great Grey Owl (*Strix nebulosa*) have been on a lesser scale than those recorded in the past, which, Curry-Lindahl fears, implies a considerable falling-off in the numbers breeding in Lapland. The Crested Lark (*Galerida cristata*) shows little tendency to recover from the havoc of the disastrous winters of 1940-42. First recorded as nesting in Sweden in 1850, this lark gradually extended its range until, some thirty years ago, it could be described as relatively common in the southern districts; but today it breeds only sparingly, in Skåne, Halland and the neighbourhood of Göteborg. Finally, both House Martins (*Delichon urbica*) and Sand Martins (*Riparia riparia*) have withdrawn from some of their breeding stations.

Against this rather depressing record must be set one notable addition to the native avifauna, and a quite satisfying list of species which have gained or recovered ground. Noted for the first time in 1949, the Collared Dove (*Streptopelia decaocto*) now breeds regularly in Skåne and Halland, is still advancing northwards, and has been found nesting in Uppland and Narke. Even in Sweden this dove lays two or three clutches a year, the last, in one case, at the end of October. With the exception of the Little Gull (*Larus minutus*), the indigenous gulls are increasing and occupying fresh territory. Most impressive has been the progress of the Herring Gull (*L. argentatus*), now established on many of the Lapland lakes. The yellow-legged form, which has taken to nesting in the interior of Finland, regularly winters in

Swedish waters. A newcomer in 1911, the Sandwich Tern (*Sterna sandvicensis*) appears to be more than holding its own. Meanwhile, Caspian Terns (*Hydroprogne caspia*) have twice reared broods as far north as Haparanda, and for at least a decade—from 1947 to 1957—two or three pairs of Little Terns (*S. albifrons*) have nested on islands in Luleå, seven degrees beyond the previously known limit of the range. Far commoner in southern and central Sweden than it was, the Woodpigeon (*Columba palumbus*) has also made its way northwards, through the coastal districts, to Haparanda, and it has even been seen in Tornea Lapland. Thanks to protection, the colony of Guillemots (*Uria aalge*) on Stor Karlö, only 19 strong in 1880, totalled 40,000 birds in 1954; this is the more satisfactory as Karlö is one of the few stations of *intermedia,* a form confined to the Baltic. A handful of Barn Owls (*Tyto alba*) fortunately survived the hard winters of the early 1940s, and by 1954 the number of occupied sites had reached three figures.

In this volume nine well-known Swedish ornithologists are responsible for the "popular-scientific" essays, which invite quotation as frequently as those in the previous ones. Recent field-work has not confirmed Sven Ekman's rather far-fetched theory that some Long-tailed Skuas (*Stercorarius longicaudus*) breed alternately in Sweden and Russia. On the contrary, flocks of these birds do ascend the Lapland fells even in seasons when Lemmings (*Lemmus lemmus*) and voles alike have almost disappeared; but they do not disperse, and, of course, make no attempt at nesting. Under such adverse conditions, the skuas have sometimes been reduced to feeding on carrion. Curry-Lindahl, who himself deals with the native gulls, considers each one as a predator, coming finally to the conclusion that while a very large colony of any one of these birds can be a serious menace to wild life, the harm done by gulls in general has been exaggerated, at least in Sweden. For example, despite the increase in the number of big gulls over the last two decades, at least three ducks—the Eider (*Somateria mollissima*), the Shelduck (*Tadorna tadorna*) and the Tufted Duck (*Aythya fuligula*)—have become more plentiful. Of the three large gulls, the Lesser Black-backed (*Larus fuscus*) seems to be the least destructive, as remains of young birds were detected in only 14 out of 1,276 pellets gathered at breeding-stations. Brief reference is made to wild hybrids between gulls—including the rather unexpected one of Lesser Black-backed × Black-headed (*L. fuscus* × *ridibundus*)—but in no case is it stated whether the bird in question was obtained, or seen, in Sweden.

White-breasted birds have occasionally been noted amongst Swedish breeding Barn Owls; three of a brood hatched by one of these resembled their parent while the fourth was a typical example of the dark-breasted phase. Paul Henrici calls attention to the curious

winter-larders of the Pygmy Owl (*Glaucidium passerinum*), one of which held seven Common Shrews (*Sorex araneus*), a Lesser Shrew (*S. minutus*), a House Mouse (*Mus musculus*), a Wood Mouse (*Apodemus sylvaticus*), twelve voles, two Great Tits (*Parus major*), a Coal Tit (*P. ater*), a Crested Tit (*P. cristatus*), two Willow Tits (*P. atricapillus*) and two Goldcrests (*Regulus regulus*). This tiny owl can surely rank amongst the more formidable predators, as it has even been known to overcome a Three-toed Woodpecker! Tawny Owls (*Strix aluco*) are often the first birds to set about nesting in Sweden, one once laying in December.

The life-histories of the various woodpeckers are especially interesting. One of two Green Woodpeckers quarrelling over an ant-hill killed its opponent with a peck that penetrated the skull. This species has mated with the Grey-headed Woodpecker, and interbreeding has also occurred between the Great Spotted and White-backed (*Dendrocopos major* and *leucotos*). Nests of Starling (*Sturnus vulgaris*), Chaffinch (*Fringilla coelebs*) and Stock Dove have been rifled and adult sparrows (*Passer*) attacked by Great Spotted Woodpeckers. Being less discriminating in its diet, this species requires a smaller territory than its White-backed ally. Curry-Lindahl credits the Black Woodpecker (*Dryocopus martius*) with hearing keen enough to locate an ant-nest under the snow.

While colonising southern Sweden, the Crested Lark followed the railways from station to station. This, together with its habit of nesting by the permanent way, earned it the name of the "Railway Lark" (Järnsväglärka). The Sand Martins in some coastal districts nest under stones on flat ground. More space is devoted to the Cuckoo (*Cuculus canorus*) than to any other bird. The list of species victimised in Sweden runs to thirty-eight, with the Shore Lark (*Eremophila alpestris*) as the most surprising. The parasitic eggs resemble those of the host more frequently, and more closely, in Sweden than in Britain. Eight well-defined types occur, some generally distributed, others more or less restricted to certain areas. The "Reed Warbler" type, for example, is found in Skåne, while the "Brambling" type predominates in Lapland. Though not neglecting the field-work of his countrymen, the writer of this essay, Curry-Lindahl himself, has drawn largely on foreign sources, including such well-known authorities as Chance, Makatsch, Paulsen and Rey. Prominence is given to the late P. F. Bunyard's account of a Cuckoo removing its eggs in its bill from the old nest of a Moorhen (*Gallinula chloropus*) to the nests of two Reed Warblers (*Acrocephalus scirpaceus*). The reviewer has no wish to revive old controversies; but he feels obliged to point out that, while Chance took pains to have his important discoveries confirmed by independent witnesses, Bunyard neglected

this precaution. Furthermore, his notes were never published in a recognised scientific journal and his claim was treated with considerable reserve by the authorities of the day.

In the previous review readers were advised that *Våra Fåglar i Norden* is a book on the birds of Sweden rather than of—as the title would imply—the whole of Scandinavia. Notes on status and distribution in Norway and Finland continue to be disappointingly brief for the most part, and occasionally misleading. For example, Yngvar Hagen's records of the breeding of the Hawk Owl (*Surnia ulula*) in southern Norway appear to have been overlooked, Tröndelag being given as the limit of its range in that country. Again, the reader is left to conclude that no competent observer has seen the Great Grey Owl breeding in Arctic Norway since Schaanning found nests there in 1904. The section on the breeding biology of the Cuckoo might usefully have included a note of the species recorded as hosts in Norway, five of which—Mealy Redpoll (*Carduelis flammea*), Red-throated Pipit (*Anthus cervinus*), Fieldfare (*Turdus pilaris*), Redwing (*T. iliacus*) and Blackbird (*T. merula*)—do not find a place on the Swedish list.

The use of coloured photographs of mounted specimens as illustrations has already been unfavourably criticised. Looking through those in the present volume, the eye is at once drawn to the painted and shrivelled tarsi, the modelled herbage and, in some cases, the bleached eggs. It is not too much to say that some birds seem almost caricatured. Far more useful, and certainly far more attractive, is the spirited black-and-white plate by Allan Brooks, showing the four skuas together. Also, the high standard so noticeable amongst the black-and-white photographs of the first two volumes is maintained. Photographers and naturalists alike will admire the lovely study of a Long-tailed Skua emerging from the mist over a Lapland fell. If any of the others should be singled out for special commendation they are the nesting series of the Little Gull, Snowy Owl (*Nyctea scandiaca*) and Hawk Owl. The editor is to be congratulated on his decision to publish once again Oliver Pike's still unrivalled sequence of a young Cuckoo evicting one of a Reed Warbler's brood.

H. M. S. Blair

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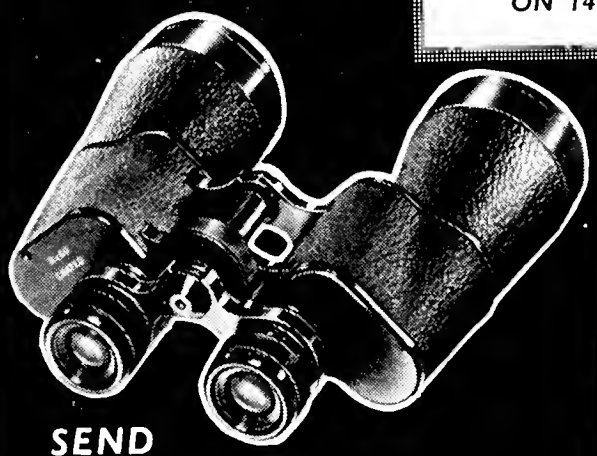

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British Birds

Vol. 55 1962

RINGING SUPPLEMENT

Report on bird-ringing for 1961*

By Robert Spencer

Ringing Officer, B.T.O.

WHETHER JUDGED by the numbers of birds ringed, by the number of species ringed, or by the number of recoveries reported, 1961 was a highly successful year. After more than 50 years of ringing, one might suppose that there would be but poor prospects of adding new species to the ringing list; yet no fewer than nine additions were made during 1961, an achievement which is surely unlikely to be repeated. The additions were Bewick's Swan (*Cygnus columbianus*) by the Wildfowl Trust, Pomarine Skua (*Stercorarius pomarinus*) by B. A. E. Marr, Cetti's Warbler (*Cettia cetti*) by J. A. Miller, River Warbler (*Locustella fluviatilis*) and Dusky Warbler (*Phylloscopus fuscatus*) by Fair Isle Bird Observatory, Radde's Bush Warbler (*Phylloscopus schwarzi*) by Cley Bird Observatory, Arctic Redpoll (*Carduelis hornemanni*) by Fair Isle Bird Observatory, Serin (*Serinus canarius*) by Spurn Bird Observatory and Fox Sparrow (*Passerella iliaca*) by Copeland Bird Observatory. The River Warbler, from eastern Europe, and the Fox Sparrow from North America, are both new birds to the British Isles. With these nine additions, the number of species on the ringing list now rises to 303, a figure which represents an impressively high proportion of the species ever recorded in the British Isles.

Although the ringing of extreme rarities may on occasion be significant, for the most part it has novelty value only, and a more down-to-earth indication of progress is to be found in the ringing figures for the common species. Table 1 reveals that 71,000 more birds were ringed in 1961 than in 1960, some 17,000 of these being nestlings. Sea birds, in particular, came in for much attention and

*This is the twenty-fifth report issued on behalf of the Bird-Ringing Committee, and is a publication of the British Trust for Ornithology. For the twenty-fourth report see *Brit. Birds*, 54: 449-508.

their individual totals nearly all show large increases. It was an excellent year for the "bread-and-butter" ducks—the Mallard and Teal—and also for the Eider, but ringing figures for most of the other Anatidae were down a little. The Blackbird had no difficulty in holding its recently won position as the bird with the highest annual total: it is possible that as many as two thousand were ringed on 5th November alone, when a vast immigration was reported down hundreds of miles of the east coast. Field observers in many parts of the country reported Dunnocks and Bullfinches to be unusually abundant in the second half of the year, and their impressions are fully supported by the ringing figures. 4,343 more Dunnocks were ringed in 1961 than in any previous year, and the figure for Bullfinches jumped from 1,780 in 1960 to 4,146, which is rather more than half of the grand total ringed between 1909 and 1960. Ringing has shown these two species to be remarkably sedentary in the normal course of events (they seldom qualify for inclusion in the selected list of recoveries) and it is thus interesting that the unusual abundance should have been followed by recoveries indicating an unusual degree of movement. For the sake of completeness, publication of some of the 1962 recoveries of these species has been advanced to this report.

Many of the species listed in Section 2 of Table 2 are clearly destined to remain in that section indefinitely. Others, equally clearly, will earn rapid promotion to Section 1. In the case of common species such as the Grey Plover, this is only to be expected. More remarkable is the Collared Dove, which first appeared in the list as recently as 1956, but has already given clear signs that early promotion to the hundred-plus category can be expected. Thirty-six were ringed in 1961, no fewer than twenty-six of them by G. Felstead, an excellent solo achievement. It is interesting to compare the ringing history of the Collared Dove with that of the Lesser Spotted Woodpecker, the ringing total for which stands at only 84 after fifty years of ringing. Is this species more exclusively arboreal than the other woodpeckers, and the Nuthatch and Treecreeper, and so more difficult to catch, or is it scarcer than is commonly supposed?

For three species which are the subject of special ringing enquiries, the results in 1961 were most gratifying. The campaign to ring Mute Swans was so successful that in some parts of the country a really substantial proportion of the population was marked, and recoveries have come forward in ever increasing numbers. The total of 351 in 1961 was surpassed by those for only five other species—Mallard, Teal, Blue Tit, Blackbird and Starling. The Sand Martin, in the second year of the study, far exceeded the expectations of the Bird-Ringing Committee when they first planned the enquiry: eight birds were recovered abroad, compared with one in 1960, and so many valuable recoveries were reported from within Great Britain that the

mileage criterion for inclusion in the report has had to be doubled from 100 to 200 miles. The Swallow, in addition to being the subject of a special breeding survey organised by C. D. T. Minton, came in for unpremeditated attention from the netters at Sand Martin roosts, and the ringing figures benefited accordingly. What we may hope is merely a foretaste of things to come occurred when a French mist-netter caught two British-ringed Sand Martins and a British-ringed Swallow at a small roost in France. As the numbers of foreign recoveries of these two species accumulate, the indirect evidence of their differing winter ecology mounts up. There are now some thirty-five recoveries of Swallows from Africa, but no British-ringed Sand Martin has ever been recovered south of Iberia.

The further big increase in the number of recoveries has necessitated the use of tabular summaries for more species than ever (a process which may be expected to continue for so long as the present annual rate of increase in ringing is maintained), but, generally speaking, the recoveries so treated break no new ground and numerous examples have been presented in full in earlier reports. From the hundreds of recoveries which do earn a coveted place in this report, attention may be drawn to some of the more noteworthy. The Manx Shearwater, for example, maintained its reputation as a far-wandering species by producing four recoveries in Brazil and one in Australia. It is not often that raptors provide surprises, and the recovery of a native Scottish Hen Harrier in northern Norway in February is as puzzling as it was unexpected. Wader recoveries, for so many years poorly represented in these annual reports, now occupy several pages and provide many interesting records. There are, for example, an Oystercatcher in the Cádiz province of Spain (this being the most southerly recovery of the species to date), the first British-ringed Golden Plover in Norway, our first recoveries of Curlew in Norway and Finland (although recoveries of Scandinavian-ringed Curlews in Britain are not uncommon), another Ruff in Siberia, and the curious record of a Common Sandpiper ringed in Essex on 13th July and retrapped in north Lincolnshire ten days later.

Great and Arctic Skuas have been receiving much attention in recent years, and one two-year-old bird of each species was recovered in Greenland during the summer months. The Roseate Tern, the rarest of our regular breeding terns, produced only four recoveries of note in the six years 1955-1960, but so many in 1961 that tabular summary has had to be employed. It is curious that the Little Tern, the most widely distributed of our breeding terns, receives so little attention: more Hen Harriers than Little Terns were ringed in 1961.

There are few surprises among the Passerine recoveries, apart from three Swallows in Italy (two in spring and one in autumn), but the lists for many species are longer than usual and there is much valuable

material for analysis. The recent trend towards more easterly recoveries of Blackbirds was maintained, with two reports from Poland, and the fine collection of Redwing recoveries includes one from the Ukraine and one from Georgia. The Georgian bird was recovered on 30th November, and is thus yet another demonstration of the erratic wintering behaviour to be found in this species. Although perhaps less dramatically than with Storm Petrels, Hirundines and Swifts, mist nets have made an immense difference to the catching of Cardueline finches, and this is plainly reflected in the unusually numerous foreign recoveries of Linnets, Goldfinches and Redpolls. One might add that these lists are also a reflection of the sporting interests of the Belgians, the French and the Spaniards. That man should have an interest in a species clearly remains the best assurance of a reasonable recovery rate. Perhaps the greatest success of the Sand Martin Enquiry has been to demonstrate that this interest need not be an economic one.

FINANCE

The work of the Bird-Ringing Committee is done under contract to the Nature Conservancy, an annual grant being received to cover the salaries of headquarters staff. A grant of £50 from the main funds of the Trust was received to meet expenses of the special ringing enquiries, and the publishers of *British Birds* made their annual grant of £25. All other expenses were met from the sale of rings.

Full accounts for 1961 have been published in the Annual Report of the British Trust for Ornithology.

COMMITTEE

The members of the Bird-Ringing Committee on 31st December 1961 were Sir Landsborough Thomson (Chairman), Miss E. P. Leach, J. S. Ash, E. J. M. Buxton, J. C. Coulson, J. Cudworth, P. R. Evans, P. A. D. Hollom, C. D. T. Minton, J. D. Macdonald (representing the Trustees of the British Museum), C. M. Perrins and R. G. Pettitt; with R. K. Cornwallis, R. A. O. Hickling, C. A. Norris, E. R. Parrinder, G. Waterston, and D. R. Wilson (*ex officiis*); and Robert Spencer (Secretary).

STAFF

Robert Spencer, R. W. Hudson, Mrs. K. E. I. Barham and Mrs. P. Nieman. Miss E. P. Leach, in an honorary capacity, had charge of all reports of rings from foreign schemes.

ACKNOWLEDGEMENTS

Grateful acknowledgement is made to the Trustees for accommodation at the British Museum (Natural History) and for permission to use the address of the museum on rings; to the Nature Conservancy for their indispensable financial support; and to H. F. and G. Witherby

Ltd. for their annual grant. At the Museum, J. D. Macdonald and the staff of the Bird Room were unfailingly helpful whenever we sought their assistance. A. J. Waller and P. J. Morgan both helped to avert crises by working in the ringing office at difficult periods, and it is a pleasure to acknowledge also our continued and great indebtedness to Miss Elsie Leach. Finally, warm thanks are due to the team of translators who helped us on numerous occasions: Derek Goodwin, A. G. Hurrell, W. R. Rybotycki and Mrs. G. Trust.

PUBLICATIONS

The following papers, based wholly or partially on the results of British ringing, have been published:

Hugh Boyd and Jeffrey Harrison (1962): "First-autumn dispersal of hand-reared Mallard". *Thirteenth Annual Report of the Wildfowl Trust:* 70-74.

J. C. Coulson (1961): "The post-fledging mortality of the Blackbird in Great Britain". *Bird Study,* 8: 89-97.

J. C. Coulson (1961): "Movements and seasonal variation in mortality of Shags and Cormorants ringed on the Farne Islands, Northumberland". *Brit. Birds,* 54: 225-235.

R. K. Murton (1961): "Some survival estimates for the Woodpigeon". *Bird Study,* 8: 165-173.

M. A. Ogilvie (1962): "Movements of Shoveler ringed in Britain". *Thirteenth Annual Report of the Wildfowl Trust:* 65-69.

J. H. Phillips (1961): "Sex and age counts of wintering thrushes". *Brit. Birds,* 54: 277-282.

M. C. Radford (1961): "A study of the British ringing records of the Common Tern and Arctic Tern and comparison with some foreign records". *Bird Study,* 8: 174-184.

R. E. Scott (1961): "Weight change in male Reed Buntings". *Bird Study,* 8: 152-154.

Table 1

NUMBERS OF BIRDS RINGED AND RECOVERED

	Ringed			*Recovered*
	Juv./Adult	*Pullus**	*Total*	*Total*
1961	272,919	77,443	350,362	9,238
1960	219,104	60,085	279,189	7,911
1959	184,837	57,488	242,325	6,949
1958	155,414	45,421	200,835	6,374
1957	137,060	49,286	186,346	5,497
1956	104,665	40,069	144,734	4,808
1955	90,585	35,718	126,303	4,063
(Grand total ringed 1909-1961 ..	..	..	..	2,881,619
(Grand total recovered 1909-1961	..	..	..	77,937

*An explanation of the term *pullus* or *pull.* appears on page 503.

Table 2

RINGING AND RECOVERY TOTALS TO 31.12.61

(*Compiled by* R. *W. Hudson*)

Section 1—Species of which more than 100 have been ringed

	Ringed				*Recovered*	
	Juv./Adult	*Pullus*	*1961 total*	*Grand total*	*1961*	*Grand total*
Little Grebe	18	1	19	196	1	10
Leach's Petrel	37	—	37	905	—	5
Storm Petrel	954	6	960	7,976	11	27
Manx Shearwater	4,766	2,164	6,930	102,580	102	1,134
Fulmar	94	821	915	6,277	9	85
Gannet	155	1,680	1,835	22,722	156	1,061
Cormorant	—	895	895	6,079	161	1,398
Shag	149	2,173	2,322	12,401	104	1,085
Heron	7	170	177	4,560	37	727
Mallard	4,051	613	4,664	35,592	742	5,228
Teal	3,071	5	3,076	33,406	524	5,703
Garganey	20	8	28	203	1	25
Gadwall	12	12	24	187	5	42
Wigeon	13	—	13	2,138	13	419
Pintail	35	3	38	560	8	118
Shoveler	38	5	43	558	13	124
Tufted Duck	28	6	34	956	11	212
Pochard	12	3	15	224	3	44
Eider	322	435	757	2,471	22	104
Shelduck	16	103	119	1,053	6	60
Grey Lag Goose	8	—	8	582	12	160
White-fronted Goose	—	—	—	505	17	131
Pink-footed Goose	—	—	—	11,821	175	2,418
Canada Goose	35	7	42	1,244	14	134
Mute Swan	3,009	83	3,092	5,451	351	630
Buzzard	—	37	37	1,024	1	55
Sparrowhawk	14	10	24	1,370	1	205
Marsh Harrier	—	2	2	123	—	14
Hen Harrier	—	115	115	570	5	59
Montagu's Harrier	—	16	16	254	3	38
Peregrine	—	3	3	173	—	24
Merlin	4	49	53	687	2	92
Kestrel	49	245	294	2,866	30	348
Red Grouse	—	—	—	1,538	—	176
Partridge	44	4	48	170	1	5
Water Rail	84	1	85	551	—	16
Cornerake	9	—	9	731	—	12
Moorhen	601	24	625	6,101	30	201
Coot	84	11	95	1,807	5	190
Oystercatcher	235	252	487	6,878	30	342
Lapwing	158	2,394	2,552	75,034	59	1,527
Ringed Plover	224	224	448	5,038	6	79
Little Ringed Plover	11	34	45	333	—	9
Golden Plover	94	20	114	688	2	21
Turnstone	106	—	106	780	6	14
Snipe	1,015	22	1,037	5,820	34	240
Jack Snipe	116	—	116	408	4	13
Woodcock	32	11	43	5,736	3	441
Curlew	315	122	437	7,203	18	295
Bar-tailed Godwit*	69	—	69	117	1	3
Green Sandpiper	27	—	27	166	—	4
Common Sandpiper	258	62	320	4,314	2	33

*Newly promoted from Section 2

	Ringed				Recovered	
	Juv./Adult	*Pullus*	*1961 total*	*Grand total*	*1961*	*Grand total*
hank	937	242	1,179	7,267	19	179
nshank*	25	1	26	109	—	4
.. .. ..	59	—	59	785	2	7
le Sandpiper* ..	55	—	55	152	—	—
: Stint	36	—	36	310	1	6
in	4,240	8	4,248	12,515	36	94
ew Sandpiper	16	—	16	159	—	—
erling	20	—	20	170	—	4
.. .. ..	115	—	115	320	1	9
: Curlew	—	3	3	366	1	21
c Skua	19	223	242	1,287	4	31
t Skua	—	502	502	2,997	10	63
t Black-backed Gull ..	98	483	581	3,664	40	227
r Black-backed Gull ..	80	2,751	2,831	27,883	109	1,159
ng Gull	737	5,352	6,089	37,302	212	1,425
mon Gull	14	254	268	4,828	13	206
-headed Gull	160	5,647	5,807	56,995	257	2,814
wake	243	1,959	2,202	17,734	60	362
mon Tern	41	2,252	2,293	33,554	47	656
c Tern	147	3,495	3,642	22,443	82	324
ate Tern	17	1,171	1,188	6,382	23	56
: Tern	5	96	101	2,150	—	29
wich Tern	12	2,961	2,973	39,874	74	704
bill	136	370	506	11,710	28	340
emot	132	271	403	8,172	16	279
Guillemot	15	63	78	615	2	7
.. .. ..	738	649	1,387	15,461	6	92
Dove	43	20	63	2,132	8	152
Dove	2	1	3	124	—	5
lpigeon	307	705	1,012	8,668	94	624
e Dove	108	47	155	1,738	4	65
oo	64	21	85	2,017	8	64
Owl	17	60	77	1,359	10	187
Owl	52	46	98	1,705	7	144
y Owl	29	99	128	2,815	11	195
-eared Owl	7	23	30	550	7	35
-eared Owl	7	19	26	432	3	33
jar	13	14	27	487	1	11
.. .. ..	2,972	175	3,147	14,456	67	336
isher	260	16	276	1,504	6	51
. Woodpecker ..	88	12	100	582	5	19
Spotted Woodpecker	146	3	149	1,043	6	47
eck	17	9	26	601	2	13
lark	1	10	11	496	—	2
k	473	421	894	10,059	12	73
ow	12,181	6,026	18,207	120,993	106	793
: Martin	2,431	49	2,480	25,225	22	190
Martin	19,177	113	19,290	61,258	266	502
.. .. ..	—	66	66	923	15	95
n/Hooded Crow ..	22	249	271	4,123	26	255
.. .. ..	122	199	321	10,358	39	680
aw	98	114	212	10,173	21	569
e	49	93	142	3,334	16	155
.. .. ..	186	49	235	2,200	12	156
gh	3	9	12	283	4	17
Tit	5,802	3,059	8,861	67,294	154	1,149
Tit	15,388	3,558	18,939	143,469	375	2,695

*Newly promoted from Section 2

	Ringed				Recovered	
	Juv./Adult	*Pullus*	*1961 total*	*Grand total*	*1961*	*Grand total*
Coal Tit	757	164	921	7,998	8	100
Marsh Tit	441	75	516	3,151	4	28
Willow Tit	233	34	267	769	2	3
Long-tailed Tit	1,099	4	1,103	3,407	13	26
Bearded Tit	206	1	207	810	—	5
Nuthatch	167	143	310	2,613	5	65
Treecreeper	317	94	411	1,304	2	5
Wren	2,049	54	2,103	15,644	19	100
Dipper	109	163	272	4,911	5	56
Mistle Thrush	528	267	795	11,270	35	328
Fieldfare	367	—	367	1,554	1	27
Song Thrush	8,222	2,639	10,861	135,397	339	3,503
Redwing	2,086	—	2,086	9,790	14	90
Ring Ouzel	43	44	87	1,775	2	30
Blackbird	24,791	3 286	28,077	220,407	981	7,383
Wheatear	1,080	179	1,259	17,007	14	82
Stonechat	379	95	474	3,414	6	27
Whinchat	406	94	500	6,570	2	24
Redstart	741	343	1,084	13,673	4	59
Black Redstart	25	5	30	639	2	16
Nightingale	68	6	74	3,645	—	13
Blucthroat	16	—	16	194	—	2
Robin	8,508	796	9,304	87,592	251	2,075
Grasshopper Warbler	30	7	37	836	—	2
Reed Warbler	1,071	171	1,242	6,468	10	35
Sedge Warbler	1,397	183	1,580	14,908	—	24
Blackcap	960	62	1,022	5,541	5	26
Barred Warbler	9	—	9	199	—	—
Garden Warbler	481	46	527	5,549	3	10
Whitethroat	3,984	393	4,377	49,701	19	187
Lesser Whitcthroat	393	26	419	3,220	—	13
Dartford Warbler	7	38	45	150	—	—
Willow Warbler	4,807	887	5,694	62,583	22	164
Chiffchaff	1,436	69	1,505	13,826	7	37
Wood Warbler	30	65	95	2,301	—	11
Goldcrest	1,101	—	1,101	6,828	—	8
Firecrest	25	—	25	229	—	—
Spotted Flycatcher	852	468	1,320	13,194	8	85
Pied Flycatcher	833	438	1,271	15,801	7	51
Red-breasted Flycatcher	17	—	17	124	—	—
Dunnock	10,302	761	11,063	66,668	138	843
Meadow Pipit	3,739	486	4,225	30,130	43	257
Tree Pipit	140	99	239	4,031	—	6
Rock/Water Pipit	658	63	721	8,508	8	60
Pied/White Wagtail	3,233	725	3,958	26,017	87	469
Grey Wagtail	230	130	360	3,005	4	19
Yellow Wagtail *ssp.*	1,522	122	1,644	11,784	8	98
Waxwing	4	—	4	122	—	4
Red-backed Shrike	50	104	154	2,432	1	19
Starling	21,937	1,305	23,242	297,523	1,027	11,836
Hawfinch	6	—	6	206	—	2
Greenfinch	15,694	541	16,235	109,883	295	1,834
Goldfinch	2,727	185	2,912	7,810	37	85
Siskin	169	—	169	624	2	6
Linnet	8,411	1,576	9,987	48,643	68	327
Twite	207	5	212	2,260	1	9
Redpoll	581	26	607	2,612	14	36
Bullfinch	3,926	220	4,146	11,614	116	269

	Ringed				Recovered	
	Juv./Adult	Pullus	1961 total	Grand total	1961	Grand total
stbill	—	—	—	199	—	2
finch	7,127	336	7,463	91,835	104	1,055
ubling	623	—	623	5,305	3	33
whammer	1,405	107	1,512	16,777	13	142
Bunting	104	16	120	1,054	—	19
Bunting	5	—	5	176	1	1
Bunting	4,076	380	4,456	18,906	31	89
Bunting	42	—	42	2,664	2	20
e Sparrow	20,900	843	21,743	123,436	311	1,747
Sparrow	6,243	716	6,959	22,513	34	98

Section 2—Species of which fewer than 100 have been ringed

961 total, grand total, 1961 recoveries and grand total recoveries are given in that order)

-throated Diver ..	—	2	—	—	Wood Sandpiper	12	87	—	1
Northern Diver ..	—	3	—	—	Spotted Redshank	4	20	—	1
throated Diver ..	3	8	—	3	Temminek's Stint	—	3	—	—
Crested Grebe ..	1	30	—	—	White-rumped Sandpiper ..	—	1	—	—
ecked Grebe	1	2	—	—	Peetoral Sandpiper ..	2	10	—	—
nian Grebe	1	3	—	—	Western Sandpiper ..	—	1	—	—
s Shearwater	—	1	—	—	Buff-breasted Sandpiper ..	—	2	—	1
n's Petrel	—	2	—	—	Avocet	—	1	—	—
Bittern	—	1	—	—	Grey Phalarope	7	33	—	—
n	5	38	—	6	Red-necked Phalarope ..	2	23	—	—
rested Pochard ..	—	16	—	4	Pomarine Skua*	1	1	1	1
.. .. ..	2	29	—	8	Glaucous Gull	—	5	—	1
arin Duck	3	5	—	—	Little Gull	—	1	—	1
meye	1	6	—	—	Black Tern	—	1	—	—
ttailed Duck	1	4	—	—	Gull-billed Tern	—	1	—	1
: Scoter	1	3	—	1	Little Auk	1	17	—	2
non Scoter	—	13	1	3	Collared Dove	36	49	3	4
rreasted Merganser ..	1	16	—	1	Scops Owl	—	1	—	—
nder	3	64	—	10	Snowy Owl	—	1	—	—
.. .. ..	—	2	—	—	Hoopoe	—	8	—	1
Goose	—	7	—	1	Lesser Spotted Woodpecker	8	84	—	—
le Goose	—	4	—	1	Short-toed Lark	—	3	—	—
per Swan	3	7	—	2	Shore Lark	10	16	—	—
s's Swan*	1	1	—	—	Golden Oriole	2	3	—	—
.. .. ..	—	1	—	—	Crested Tit	14	65	—	—
-legged Buzzard ..	—	1	—	—	Black-throated Thrush ..	—	1	—	—
n Eagle	10	50	—	3	Dusky Thrush	1	2	—	—
.. .. ..	4	57	1	5	American Robin	—	1	—	—
oted Falcon	—	1	—	—	Siberian Thrush	—	1	—	—
Grouse	1	15	—	—	Grey-cheeked Thrush ..	1	3	1	1
gan	1	3	—	—	Desert Wheatear	—	2	—	—
aillie	—	3	—	—	Black-eared Wheatear ..	—	1	—	—
gged Partridge ..	3	75	—	12	Pied Wheatear	—	1	—	—
.. .. ..	1	6	—	—	Thrush Nightingale ..	—	2	—	—
nt	—	64	—	4	Cetti's Warbler*	1	1	—	—
d Crake	—	8	—	—	River Warbler*	1	1	—	—
n Plover	—	1	—	—	Lanceolated Warbler ..	—	2	—	—
lover	29	95	1	3	Pallas's Grasshopper Warbler	—	1	—	—
el	4	38	—	—	Great Reed Warbler ..	—	1	—	—
rel	9	54	—	1	Marsh Warbler	16	83	—	—
ailed Godwit ..	—	9	—	—					

*Added to the list in 1961

Paddyfield Warbler	—	1	—	—
Aquatic Warbler	3	23	—	—
Thick-billed Warbler	—	1	—	—
Melodious Warbler	9	53	—	—
Icterine Warbler	10	93	—	—
Olivaceous Warbler	—	3	—	—
Booted Warbler	—	1	—	—
Orphean Warbler	—	1	—	—
Sardinian Warbler	—	1	—	—
Subalpine Warbler	—	9	—	—
Greenish Warbler	2	16	—	—
Bonelli's Warbler	3	6	—	—
Arctic Warbler	1	8	—	—
Yellow-browed Warbler	4	53	—	—
Pallas's Warbler	—	3	—	—
Dusky Warbler*	1	1	—	—
Radde's Bush Warbler*	1	1	—	—
Richard's Pipit	1	2	—	—
Tawny Pipit	—	2	—	—
Pechora Pipit	—	1	—	—
Red-throated Pipit	1	3	—	—
Yellow-headed Wagtail	—	2	—	—
Great Grey Shrike	2	46	—	1
Lesser Grey Shrike	—	5	—	2
Woodchat Shrike	1	35	—	—
Myrtle Warbler	—	1	—	—
Yellowthroat	—	1	—	—
Northern Waterthrush	—	1	—	—
Slate-coloured Junco	—	1	—	—
Rose-coloured Starling	1	2	—	—
Baltimore Oriole	—	1	—	—
Summer Tanager	—	1	—	—
Arctic Redpoll*	2	2	—	—
Serin*	1	1	—	—
Scarlet Grosbeak	—	26	—	—
Pine Grosbeak	—	1	—	—
Black-headed Bunting	—	1	—	—
Red-headed Bunting	3	10	—	—
Yellow-breasted Bunting	—	2	—	—
Ortolan Bunting	2	24	—	—
Rustic Bunting	—	7	—	—
Little Bunting	2	13	—	—
Fox Sparrow*	1	1	—	—
Song Sparrow	—	1	—	—
Lapland Bunting	6	65	—	—
Hybrids				
Common × Red-crested Pochard	1	1	1	1
House × Tree Sparrow	1	3	—	—

*Added to the list in 1961

Table 3

NUMBERS AND DISTRIBUTION OF RINGERS (as at 31.12.61)

ENGLAND	*Category of permit*			
County	A	B	C	*Total*
Bedfordshire	3	—	1	4
Berkshire	15	5	1	21
Buckinghamshire	11	—	—	11
Cambridgeshire	8	2	1	11
Cheshire	19	1	10	30
Cornwall	3	—	—	3
Cumberland	3	—	1	4
Derbyshire	11	—	—	11
Devonshire	8	—	2	10
Dorset	10	1	2	13
Durham	10	3	2	15
Essex	37	3	12	52
Gloucestershire	14	2	4	20
Hampshire	29	—	5	34
Herefordshire	3	—	—	3
Hertfordshire	18	—	1	19
Huntingdonshire	2	1	—	3
Kent	46	6	2	54
Lancashire	24	—	4	28
Leicestershire	8	1	—	9
Lincolnshire	11	1	9	21
London	17	2	2	21
Middlesex	17	—	8	25
Norfolk	3	6	—	9
Northamptonshire	6	1	1	8
Northumberland	8	5	3	16
Nottinghamshire	11	—	2	13
Oxfordshire	21	2	1	24
Shropshire	2	—	1	3
Somerset	15	—	3	18
Staffordshire	10	—	2	12
Suffolk	13	3	—	16
Surrey	52	1	5	58
Sussex	21	—	3	24
Warwickshire	23	2	2	27
Westmorland	3	—	—	3
Wiltshire	9	—	3	12
Worcestershire	4	—	—	4
Yorkshire	72	12	10	94
Isle of Man	3	—	2	5

SCOTLAND	*Category of permit*			
County	A	B	C	*Total*
Aberdeenshire	2	3	1	6
Argyllshire	1	—	—	1
Ayrshire	2	—	1	3
Dumfriesshire	2	—	—	2
East Lothian	2	—	—	2
Fife	3	—	—	3
Inverness-shire	2	—	2	4
Kirkcudbright	3	—	—	3
Lanarkshire	2	—	—	2
Midlothian	15	7	—	22
Orkney	1	—	—	1
Shetland	1	3	—	4
Stirlingshire	2	—	—	2
Sutherland	1	—	—	1

WALES	Category of permit					Category of permit			
County	A	B	C	Total	County	A	B	C	Total
Jersey	1	—	—	1	Pembrokeshire	4	2	—	6
Monmouthshire	2	—	—	2	IRELAND				
Caernarvonshire	—	—	1	1	Antrim	5	4	4	13
Glamorgan	1	—	—	1	Down	4	3	1	8
Glamorgan	8	—	—	8	Dublin	2	—	—	2

Selected list of recoveries reported during 1961

The following list is highly selective. To indicate the quantity and nature of the material omitted, the total number of recoveries is stated in brackets after the scientific name of each species, followed by the minimum movement to qualify for inclusion and the longest time lapsed between ringing and recovery. All foreign recoveries are either given in full or mentioned in the summaries. Species which produced only local recoveries are left out, but the individual totals thus omitted are listed in Table 2.

Key to symbols and terms

Ring number: Where this is in italics the ring has been returned.

Age: pull. (pullus)—nestling or chick, *not yet flying*;
juv.—young, *able to fly freely*;
1stW.—first winter;
1stS.—first summer (one year old);
f.g.—full-grown, age uncertain;
ad.—adult; at least one year old.

Sex: ♂—male;
♀—female.

Manner of recovery: v—caught or trapped, and released with ring;
+—shot or killed by man;
×—found dead or dying;
×A—found long dead;
()—caught or trapped alive and not released, or released but with ring removed;
/?/—manner of recovery unknown.

Date of recovery: Where this is unknown the date of the reporting letter is given in brackets.

Distance: The distance, given in miles, and the directions are approximate.

Arrangement of entry: Recoveries are arranged by species, and within the species usually by ringing locality from north to south. Ringing details are given on the first line and recovery data on the second.

Storm Petrel (*Hydrobates pelagicus*) (11; 30 miles; 3 years)

AX	ad.	12.7.60	Foula: 60°08′N. 2°05′W. (Shetland) EEJ
	()	30.6.61	Mousa (Shetland) 36m. ESE.
SS	ad.	3.8.61	Foula BEG
	×	31.8.61	Garderhouse, Mainland (Shetland) 30m. ENE.

Manx Shearwater (*Procellaria puffinus*) (102; 9$\frac{1}{12}$ years)

568	pull.	9.9.60	Skokholm
	×A	*c.* 22.11.61	*near* Venus Bay: 33°10′S. 134°28′E. (South Australia) **Australia**

ECo568–	pull.	27.8.61	Skokholm
	×	(8.11.61)	Bay of Guanabara: *c.* 22°50′S. 43°12′W. (Rio de Janeiro) **Brazil**
ECo5827	pull.	31.8.61	Skokholm
	×	18.10.61	Bay of Guanabara, **Brazil**
EC07739	pull.	4.9.61	Skokholm
	×	7.12.61	Itanhaem: 24°07′S. 46°44′W. (São Paulo) **Brazil**
ECo8187	pull.	6.9.61	Skokholm
	+	*c.* 20.10.61	Porto Bello: 27°05′S. 48°35′W. (Santa Catarina) **Brazil**

2057768 is the first British-ringed bird of any species to be recovered in Australia; it is thought that it probably came ashore during the winter storms some three or four months before its body was found. Including those listed above, there have now been eighteen recoveries of Manx Shearwaters in South American waters (see Map 2 on pages 524-525).

In addition, 22 Manx Shearwaters were recovered in the Bay of Biscay at distances of up to 150 miles off shore. Four of these were regarded as being off the Spanish coast, one being recovered in February, two in March and one in September. Off the French coast, one was recovered in March, twenty in April and one in August.

Fulmar (*Fulmarus glacialis*) (9; 100 miles; 2 $\frac{9}{12}$ years)

AT45259	pull.	12.7.58	Unst: 60°41′N. 0°56′W. (Shetland) RWJS
	()	10.12.60	**Barents Sea**: 70°57′N. 31°30′E.
3054799	pull.	15.8.58	Gairsay: 59°05′N. 2°58′W. (Orkney) AU
	v	(29.5.61)	**The Skagerrak**: *c.* 58°40′N. 10°00′E.
AT81522	pull.	22.8.61	South Ronaldsay: 58°47′N. 2°56′W. (Orkney) AU
	()	*c.* 20.9.61	Sygnefest: 61°03′N. 5°03′E. (Sogn-og-Fjordane) **Norway**
AT62103	pull.	24.7.59	Castlecraig: 57°41′N. 3°59′W. Nigg (Ross) MCWE
	+	22.7.61	*off* Cape Bauld: 51°38′N. 55°26′W. **Newfoundland**
AT69367	pull.	13.8.60	Tarbat Ness: 57°32′N. 3°46′W. (Ross) AJW
	+	5.1.61	Ondárroa: 43°19′N. 2°25′W. (Vizcaya) Spain
AT46452	1stW.	29.8.58	Seahouses: 55°35′N. 1°39′W. (Northumberland) MHBO
	()	0.7.60	*near* Belle Isle: 50°43′N. 55°35′W. **Newfoundland**

Gannet (*Sula bassana*) (156; 8 years)

Table A—Countries and months of recoveries of Gannets

Country of recovery	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Denmark (4)	–	3	–	–	–	–	–	–	–	–	1	–
Germany (1)	–	–	–	–	–	1	–	–	–	–	–	–
Netherlands (1)	1	–	–	–	–	–	–	–	–	–	–	–
"Channel"(4*)	–	1	(1)	(1)	–	–	–	–	–	–	–	–
"Biscay" (36)	4	21	3	1	–	–	–	3	2	–	2	–
Portugal (6) and S. Spain (2)	–	4	1	1	–	–	1	–	–	–	–	1
NW Africa (14)	–	5	2	5	1	–	–	–	–	–	–	1

*Total includes one reported as "summer"

NOTE. Tables A-K are subject to error in cases where it has been necessary to assume that the date of recovery was approximately that of the letter reporting it, whereas the bird may have been dead for some time before being found or reported. Records of this type are bracketed when they are the only ones for the months concerned, but this treatment is not, of course, possible when there are several records for the same month

total of 71 Gannets were recovered outside British coastal waters, and 68 of see are summarised in Table A. The other three, given in full below, include first recoveries of British ringed Gannets in Libya and the Faeroe Islands.

4410	pull.	11.7.61	Bass Rock: 56°04′N. 2°38′W. (East Lothian) NT
	()	3.11.61	*off* Bône: 36°55′N. 7°45′E. **Algeria**
8813	pull.	11.8.61	Great Saltee
	()	4.11.61	*off* Tripoli: 32°53′N. 13°12′E. **Libya**
9441	pull.	7.7.58	Grassholm: 51°41′N. 5°15′W. (Pembroke) SBO
	+	28.7.61	Mykineshólm: 62°07′N. 7°38′W. **Faeroe Islands**

Cormorant (*Phalacrocorax carbo*) (161; $14\frac{8}{12}$ years)

ny more Cormorants than usual were recovered abroad and these are summised in Table B; no fewer than twelve of them had been ringed on Little see (Wexford) and only four were from east coast colonies. There were 41 overies involving movements of between 150 and 300 miles within British ers, all of them showing a southerly trend save 15, ringed on Little Saltee, ch moved north.

Table B—Countries and months of recoveries of Cormorants

y of recovery	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
(23) and nnel Is. (1)	(2)	3	3	4	5	4	(1)	1	1	–	–	–
na (2)	–	–	–	–	–	2	–	–	–	–	–	–
nd (1)	–	–	–	–	–	1	–	–	–	–	–	–

See footnote to Table A

Shag (*Phalacrocorax aristotelis*) (104; $8\frac{11}{12}$ years)

ringed in Shetland were recovered overseas between August and December heir first winter, three in the provinces of Sogn-og-Fjordane and Rogaland, way, and one in Jutland, Denmark. Eight from Scottish and Northumbrian nies were recovered during the winter months at localities more than 150 south of their breeding colonies. Four ringed in the Isles of Scilly were vered overseas in the January of their first winter, one in Guernsey nnel Islands), two in Finistère (France) and one in Loire Atlantique (France). lly two made northward journeys of more than 150 miles, and these recoveries iven in full below, together with two interesting inland records.

228	pull.	31.5.60	Calf of Man: 54°03′N. 4°49′W. CMRS
	()	6.10.61	Sound of Eriskay, Outer Hebrides, 225m. NW.
658	pull.	6.6.61	*off* Aberdaron: 52°48′N. 4°42′W. (Caernarvon) BBO
	v	26.10.61	Rockingham (Northampton) 160m. E.
	×	28.10.61	Boston (Lincoln) = 42m. NE. of Rockingham
714	pull.	6.7.61	*off* Aberdaron BBO
	v	26.10.61	Rockingham
771	pull.	18.6.61	Annet: 49°54′N. 6°22′W. Scilly (Cornwall) SABO
	×	17.9.61	Criccieth (Caernarvon) 225m. NE.

Heron (*Ardea cinerea*) (37; 150 miles; $4\frac{9}{12}$ miles)

	pull.	26.4.59	Deeping St. James: 52°40′N. 0°17′W. (Lincoln) CBC
	×	3.1.61	*near* Landerneau: 48°27′N. 4°16′W. (Finistère) **France**

520007	pull.	26.4.59	Guyhirn: 52°37′N. 0°04′E. (Cambridge) CBC
	×	(6.7.61)	San Pedro de Ceque: 42°03′N. 6°04′W. (Zamora) **Spain**
1008793	pull.	7.5.60	Denver Sluice: 52°35′N. 0°22′E. (Norfolk) CBC
	×	5.1.61	Réville: 49°37′N. 1°15′W. (Manche) **France**

Mallard (*Anas platyrhynchos*) (742; 8 3/12 years)

Table C—Countries and months of recovery of Mallard

Country of recovery	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Summer ringed†
France (16)	–	–	–	2	1	–	1	6	5	–	1	–	2
Netherlands (42*)	–	–	–	2	15	7	9	2	3	2	1	–	7
Denmark (21)	–	–	–	–	5	4	4	4	3	1	–	–	1
Germany (14)	–	–	–	–	3	3	5	2	–	1	–	–	2
Poland (1)	–		–	–	–	–	1	–	–	–	–	–	–
Norway (1) and Sweden (26)	1	–	–	–	14	7	2	2	–	–	–	1	–
Finland (11)	1	2	1	–	4	2	1	–	–	–	–	–	1
U.S.S.R. (10) and Baltic States (2)	2	1	–	–	4	4	–	–	–	1	–	–	1

*Total includes one reported as "August/September"

† Of the 144 birds included in this table, 14 were ringed in Britain during the summer months (April-August) and these are repeated in the end column to show country of recovery

See footnote to Table A

AJ14562	f.g. ♀	30.10.58	Peakirk: 52°38′N. 0°17′W. (Northampton)
	v	11.11.59	Meetkerke: 51°14′N. 3°09′E. (West Flanders) **Belgium**[1]
	+	1.8.61	*near* Växjö: 56°52′N. 14°50′E. (Småland) **Sweden**
AJ14745	f.g. ♂	14.11.58	Peakirk
	+	12.12.59	Knezha: 43°30′N. 24°07′E. (Vratsa) **Bulgaria**

[1]Given *Bruxelles* ring 3H1508

Teal (*Anas crecca*) (524; 8 years)

A total of 180 Teal were recovered abroad. Multiple recoveries and those from unusual localities are published here in full and the remainder are summarised in Table D.

Table D—Countries and months of recoveries of Teal

Country of recovery	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
France (34)	–	–	–	1	2	2	–	3	20	2	1	3
Netherlands (17*) and Belgium (2)	–	–	–	–	2	6	1	6	–	2	1	1
Denmark (20)	–	–	–	–	1	10	6	2	–	–	1	–
Germany (15) and Poland (1)	–	–	–	–	4	9	3	–	–	–	–	–
Norway (4) and Sweden (7*)	1	2	1	–	4	2	–	–	–	–	–	–
Finland (24)	–	3	1	–	13	6	1	–	–	–	–	–
Russia (42) and Baltic States (6*)	10	7	–	–	14	14	2	–	–	–	–	–

*Total includes undated spring or summer recoveries

See footnote to Table A

3002919	pull.	29.6.56	Gladhouse Reservoir: 55°46′N. 3°08′W. (Midlothian)	RWJS
	+	10.9.61	Kirton, Boston (Lincoln) 240m. SE.	

Birds ringed at Abberton were recovered abroad as follows:

Ringed		Recovered	
7381	5.11.56	30.11.59	Abberton
		14.8.61	Novorzhev: 57°01′N. 29°20′E. (Pskov) **U.S.S.R.**
1335	15.3.58	21.10.61	Biesbosch: 51°43′N. 4°50′E. (Noord-Brabant) **Netherlands**[1]
		27.12.61	Overton, Lancaster: 54°01′N. 2°53′W.
1438	23.8.59	0.6.60	Raanujärvi: 66°40′N. 24°40′E. (Lappi) **Finland**
		12.11.61	Hamford Water: 51°53′N. 1°15′E. (Essex)
1653	6.9.59	12.10.61	Valli del Mezzano: 44°42′N. 12°15′E. (Ferrara) **Italy**
3356*	9.9.59	28.2.61	Abberton
		10.5.61	Khanty-Mansiysk: 61°00′N. 69°06′E. (Tumen) **U.S.S.R.**
1719	9.9.59	(24.3.61)	Lagos: 37°05′N. 8°40′W. (Algarve) **Portugal**
0676*	8.10.59	2.11.59	La Tour du Valat: 43°30′N. 4°40′E. (Bouches-du-Rhône) **France**[2]
		26.11.61	*near* Châtillon-Coligny: 47°46′N. 2°51′E. (Loiret) **France**
8882*	18.11.59	27.12.61	*near* Pazardzhik: 42°15′N. 24°17′E. (Plovdiv) **Bulgaria**
0508	18.12.61 (09.30)	19.12.61 (07.30)	Couthures sur Garonne: 44°30′N. 0°05′E. (Lot-et-Garonne) **France**

*Ringed as juvenile or first-winter; the remainder were ringed as full-grown
[1]Given *Leiden* ring 3026475
[2]Given *Paris* ring EF5928

Fifty-seven movements of more than 100 miles were recorded within Great Britain and 36 Teal marked in England were recovered in Ireland.

Garganey (*Anas querquedula*) (1; $\frac{9}{12}$ year)

5522	ad. ♂	19.5.60	Abberton
	+	26.2.61	Sremska Mitrovica: 44°59′N. 19°39′E. (Vojvodina) **Jugoslavia**

Gadwall (*Anas strepera*) (5; 50 miles; 2 years)

3369	ad. ♂	18.10.59	Deeping St. James: 52°40′N. 0°17′W. (Lincoln)
	+	0.11.61	Grand Radeau: 43°29′N. 4°22′E. (Bouches-du-Rhône) **France**
11302	ad. ♀	2.5.61	Abberton
	+	10.9.61	Villars les Dombes: 46°00′N. 5°02′E. (Ain) **France**
6047	f.g. ♂	5.3.61	Slimbridge
	+	1.9.61	Lake Tåkern: 58°23′N. 14°53′E. (Östergötland) **Sweden**

Wigeon (*Anas penelope*) (13; 50 miles; 8$\frac{5}{12}$ years)

Birds ringed at Peakirk, 52°38′N. 0°17′W. (Northampton), were recovered as follows:

Ringed		Recovered	
78	11.4.56	24.10.61	Lisnaskea (Fermanagh) 315m. WNW.
61*	28.9.59	*spring* 60	Makariev: 57°53′N. 43°48′E. (Kostroma) **U.S.S.R.**
13*	27.10.59	15.4.61	Kimovsk: 53°58′N. 38°31′E. (Tula) **U.S.S.R.**

*Ringed as juvenile

Birds ringed at Abberton were recovered as follows:

Ringed		Recovered	
913683*	14.12.52	22.5.61	Sukhorukov: 61°30′N. 68°02′E. (Tumen) **U.S.S.R.**
3008686	13.3.56	20.2.61	*near* Vignory: 48°17′N. 5°06′E. (Haute-Marne) **France**
3008701	16.3.56	*early* 5.61	Onega: 63°55′N. 38°06′E. (Arkhangel) **U.S.S.R.**
3024051	15.1.57	16.4.61	Sterlitamak: 53°38′N. 55°57′E. (Bashkir) **U.S.S.R.**
*3024838**	26.11.57	18.5.61	Izhma: 65°00′N. 53°53′E. (Komi) **U.S.S.R.**
3024904	29.11.57	23.5.60	Ivlevski: 65°56′N. 72°10′E. (Tumen) **U.S.S.R.**
*AT70923**	13.11.60	6.9.61	*near* Kingisepp: 58°12′N. 22°30′E. (Saaremaa) **Estonian S.S.R.**

*Ringed as juvenile

AJ26044	f.g. ♂	12.2.61	Slimbridge
	+	17.5.61	Berezovo: 63°55′N. 65°02′E. (Tumen) **U.S.S.R.**

Pintail (*Anas acuta*) (8; 10 miles; 5 years)

918907	juv.	23.9.56	Deeping St. James: 52°40′N. 0°17′W. (Lincoln)
	×	25.9.61	Suoyarvi: 62°06′N. 32°20′E. **Karelian S.S.R.**
3042436	f.g. ♂	0.2.60	Deeping St. James
	+	6.1.61	Kirkconnel (Dumfries) 210m. NW.
3042451	f.g. ♀	27.10.60	Deeping St. James
	+	13.8.61	Lake Kubenskoye: 59°27′N. 39°43′E. (Vologda) **U.S.S.R.**
933027	ad. ♂	10.2.58	Abberton
	×	23.5.61	Käymäjarvi: 67°22′N. 23°06′E. (Norrbotten) **Sweden**
946043	f.g. ♀	28.10.57	Slimbridge
	+	22.9.61	*near* Werkendam: 51°48′N. 4°49′E. (Noord-Brabant) **Netherlands**
3007293	juv. ♀	11.11.59	Slimbridge
	+	0.5.61	Shuryshkarsk: 65°22′N. 64°40′E. (Tumen) **U.S.S.R.**
AJ26036	juv. ♀	10.11.60	Slimbridge
	+	2.11.61	*near* Husum: 54°29′N. 9°04′E. (Schleswig-Holstein) **Germany**

Shoveler (*Spatula clypeata*) (13; 100 miles; 6$\frac{4}{12}$ years)

919074	f.g. ♂	21.3.57	Deeping St. James: 52°40′N. 0°17′W. (Lincoln)
	+	16.11.61	Dybsöfjorden: 55°08′N. 11°47′E. (Sjaelland) **Denmark**
919080	f.g. ♀	2.4.57	Deeping St. James
	+	2.2.61	Villafranca y los Palacios: 37°10′N. 5°55′W. (Sevilla) **Spain**
AJ26039	juv. ♀	7.12.60	Slimbridge
	+	8.10.61	Ballynacarrigy (Westmeath) 250m. WNW.
Orielton	f.g. ♂	25.12.57	Orielton: 51°40′N. 4°57′W. (Pembroke)
5877	+	20.4.61	Zagorsk: 56°20′N. 38°08′E. (Moscow) **U.S.S.R.**

Birds ringed at Abberton were recovered as follows:

Ringed		Recovered	
932877	31.5.55	22.10.61	Errindlev: 54°41′N. 11°30′E. (Lolland) **Denmark**
*933046**	18.7.59	30.3.60	Guines: 50°51′N. 1°52′E. (Pas-de-Calais) **France**
933047*	18.7.59	(7.3.61)	Ardea: 41°36′N. 12°33′E. (Lazio) **Italy**
933072	27.4.60	5.9.61	Killingholme (Lincoln) 130m. NNW.
933080	22.5.60	10.9.61	Frodsham (Cheshire) 185m. NW.
AT70902	25.6.60	15.1.61	Tauriac le Moron: 45°03′N. 0°34′W. (Gironde) **France**
*AT70914**	16.9.60	(2.2.61)	Valley (Anglesey) 245m. WNW.

*Ringed as pulli or juveniles; the remainder were ringed as full-grown

Tufted Duck (*Aythya fuligula*) (11; 25 miles; $5\frac{5}{12}$ years)

2221	f.g. ♂	7.10.58	Deeping St. James: 52°40′N. 0°17′W. (Lincoln)
	+	(8.9.61)	Ballyconnel (Cavan) 315m. WNW.

rds ringed at Abberton were recovered as follows:

Ringed		Recovered	
43	28.2.56	0.8.61	Chojnice: 53°42′N. 17°32′E. (Bydgoszcz) **Poland**
12	7.1.58	12.9.61	Kholmogorsky: 64°12′N. 41°35′E. (Arkhangel) **U.S.S.R.**
19	8.1.60	13.8.61	Monastyrsk: 59°16′N. 28°22′E. (Leningrad) **U.S.S.R.**
1925*	19.11.60	1.11.61	Ljusterö: 59°32′N. 18°40′E. (Stockholm) **Sweden**
1940	21.2.61	17.9.61	Velký Pálenec: 49°22′N. 13°42′E. (Plzen) **Czechoslovakia**

*Ringed as juvenile; the remainder were ringed as adults

Pochard (*Aythya ferina*) (3; 10 miles; $\frac{4}{12}$ year)

2276	ad. ♀	25.1.61	Abberton
	×	26.2.61	Falsterbo: 55°23′N. 12°50′E. (Malmöhus) **Sweden**
189	pull.	16.6.61	Abberton
	+	3.11.61	Le Grand Lemps: 45°24′N. 5°25′E. (Isère) **France**

ommon × **Red-crested Pochard** (*Aythya ferina* × *Netta rufina*) (1; $\frac{6}{12}$ year)

663	ad. ♂	18.5.61	Abberton
	+	24.11.61	Vinkeveen: 52°14′N. 4°56′E. (Utrecht) **Netherlands**

Eider (*Somateria mollissima*) (22; 10 miles; $5\frac{11}{12}$ years)

774	ad. ♀	26.7.61	Newburgh: 57°19′N. 2°01′W. (Aberdeen) AU
	×	17.12.61	Buddon Ness (Angus) 63m. SSW.

Shelduck (*Tadorna tadorna*) (6; 10 miles; $\frac{10}{12}$ year)

	pull.	20.8.60	*near* Sutton Bridge: 52°44′N. 0°11′E. (Lincoln) M&B
	+	14.1.61	Kidwelly (Carmarthen) 200m. WSW.
	1stW.	7.10.61	Harty: 51°22′N. 0°55′E. Sheppey (Kent) WFAB
	+	20.12.61	Nieul-sur-Mer: 46°12′N. 1°10′W. (Charente-Maritime) **France**

Grey Lag Goose (*Anser anser*) (12; 200 miles; $7\frac{5}{12}$ years)

	ad.	14.11.53	(Kinross)
	+	*early* 5.56	Artún: 65°28′N. 14°18′W. (Nordur Múlasýsla) **Iceland**
	ad.	14.11.53	(Kinross)
	+	27.4.61	*near* Eidhar: 65°22′N. 14°20′W. **Iceland**

White-fronted Goose (*Anser albifrons*) (17; 150 miles; $9\frac{8}{12}$ years)

ringed at Slimbridge were recovered as follows:

Ringed		Recovered	
	22.2.52	3.1.61	Vilm: 54°19′N. 13°32′E. (Mecklenburg) **Germany**
*	29.2.52	12.11.61	Wittow: 54°37′N. 13°17′W. (Mecklenburg) **Germany**
*	21.2.58	29.10.61	*near* Bredstedt: 54°37′N. 8°57′E. (Schleswig-Holstein) **Germany**
*	21.2.58	25.10.60	Kirov: 54°05′N. 34°19′E. (Kaluga) **U.S.S.R.**
:*	4.3.58	16.1.61	*near* Klundert: 51°40′N. 4°32′E. (Noord-Brabant) **Netherlands**
	4.3.58	28.4.61	Nekrasovskoye: 57°40′N. 40°22′E. (Yaroslav) **U.S.S.R.**
	4.3.58	23.1.61	*near* Klausdorf: 54°25′N. 13°01′E. (Mecklenburg) **Germany**

SWT313	4.3.58	7.5.61	*near* Vel'sk: 61°05′N. 42°08′E. (Arkhangel) **U.S.S.R.**
SWT329	4.3.58	23.1.61	*near* Klausdorf, **Germany**
SWT348	9.3.59	20.1.61	Nijkerk: 52°14′N. 5°29′E. (Gelderland) **Netherlands**[1]
SWT350	9.3.59	10.10.61	Sehors: 51°50′N. 31°58′E. (Chernigov) **U.S.S.R.**
SWT360	9.3.59	26.4.61	Bezhetsk: 57°47′N. 36°50′E. (Kalinin) **U.S.S.R.**
SWT373*	9.3.59	3.2.61	*near* Nyega: 53°07′N. 6°03′E. (Friesland) **Netherlands**[2]
SWT408	9.3.59	(3.3.61)	*near* Oosthem: 53°01′N. 5°36′E. (Friesland) **Netherlands**
1007368	9.3.59	0.8.60	Cape Yasali: *c.* 69°00′N. 69°30′E. (Tumen) **U.S.S.R.**
1007395	9.3.59	26.1.61	*near* Klundert, **Netherlands**

*Ringed as first-winter; the remainder were ringed as full-grown

[1] Given *Leiden* ring 8001368

[2] Given *Leiden* ring 8001188

Pink-footed Goose (*Anser arvensis brachyrhynchus*) (175; 10$\frac{4}{12}$ years)

Three ringed in Scotland were recovered in Iceland between June and September and a further four were recovered in east Greenland between May and August. Other recoveries include two originally ringed in Iceland in 1953 and re-ringed in Britain in subsequent winters; and three originally ringed in Britain in 1952 and re-trapped in Iceland in 1953.

Canada Goose (*Branta canadensis*) (14; 100 miles; 8$\frac{5}{12}$ years)

129358	ad.	17.6.53	Stapleford: 52°45′N. 0°48′W. (Leicester)
	+	(28.11.61)	Dinnington (Northumberland) 160m. NNW.
SWT230	juv. ♀	26.6.53	Stapleford
	transp.	26.6.53	Frampton-on-Severn: 51°46′N. 2°22′W. (Gloucester)
	v	11.7.56	Frampton-on-Severn
	×	(6.5.61)	Riseholme (Lincoln) (=130m. NE. from Frampton)

Mute Swan (*Cygnus olor*) (351; 70 miles; 4$\frac{10}{12}$ years)

YB2230	ad.	22.7.61	Portobello: 55°57′N. 3°07′W. (Midlothian) DRA
	v	21.9.61	Amble (Northumberland) 70m. SE.
Z1820	3rdW.	4.9.60	Hornsea Mere: 53°54′N. 0°11′W. (York) GRB
	v	31.8.61	Whittlesey (Cambridge) 93m. S.
Zo889	1stW.	14.1.61	Eastbourne: 51°00′N. 0°44′W. (Sussex) JFN
	×	22.4.61	Wimereux: 50°46′N. 1°37′E. (Pas-de-Calais) **France**
Z4040	ad.	14.5.61	Chichester Channel: 50°59′N. 0°50′W. (Sussex) ABW
	×A	20.7.61	Bray-Dunes: 51°04′N. 2°30′E. (Nord) **France**

The last two are the first British-ringed Mute Swans to be recovered abroad.

Hen Harrier (*Circus cyaneus*) (5; 75 miles; 1$\frac{7}{12}$ years)

3051493	pull. ♀	2.7.59	(Orkney) EB
	×A	(18.2.61)	West Fearn (Ross) 90m. SW.
3039251	pull. ♀	5.7.59	(Orkney) EB
	×	24.2.61	Buröya: *c.* 67°50′N. 14°45′E. Grötöy (Nordland) **Norway**
3071303	pull.	1.7.60	(Orkney) EB
	×	(31.1.61)	High Grantley, Ripon (York) 340m. SSE.

3039251 is only the second British-ringed Hen Harrier to be recovered abroad; the locality is well to the north of the Arctic Circle.

Montagu's Harrier (*Circus pygargus*) (3; 2 1/12 years)

9957	pull.	8.7.61	(Northumberland) ND&N
	+	19.8.61	Gonesse: 48°59′N. 2°27′E. (Seine-et-Oise) **France**
0468	pull.	17.7.61	(Dorset) RFH
	+	4.9.61	Varaize: 45°55′N. 0°24′W. (Charente-Maritime) **France**
18881	pull.	20.7.59	Dartmoor (Devon) AVS
	+	9.9.61	Bidart: 43°26′N. 1°35′W. (Basses-Pyrénées) **France**

Merlin (*Falco columbarius*) (2; 7 2/12 years)

0274	juv. ♂	4.9.54	Fair Isle
	()	20.11.61	Soustons: 43°45′N. 1°19′W. (Landes) **France**
00680	pull.	30.6.61	(Orkney) EB
	+	*c.* 3.9.61	Munlochy, Black Isle (Ross) 100m. SSW.

Kestrel (*Falco tinnunculus*) (3; 150 miles; 4 9/12 years)

1443	pull.	25.6.61	Colinton: 55°54′N. 3°16′W. (Midlothian) IVBP
	×	19.10.61	Newry (Down) 170m. SW.
65849	pull.	15.6.61	Moniaive: 55°11′N. 3°55′W. (Dumfries) TT
	×	10.12.61	East Horndon (Essex) 300m. SE.
658206	pull.	18.6.61	*near* Sedbergh: 54°19′N. 2°32′W. (York) PJM
	×	*c.* 20.8.61	Cheltenham (Gloucester) 165m. S.
1598	pull.	1.7.61	*near* Sedbergh PJM
	×	10.11.61	*near* Tonbridge (Kent) 240m. SE.
73256	pull.	29.6.61	Bardsey
	+	25.9.61	Burguete: 42°59′N. 1°20′W. (Navarra) **Spain**
8855	pull.	14.6.61	Winchester: 51°04′N. 1°19′W. (Hampshire) WC
	+	24.9.61	Moncontour: 48°22′N. 2°38′W. (Côtes-du-Nord) **France**

Moorhen (*Gallinula chloropus*) (30; 50 miles; 5 11/12 years)

02202	ad.	26.3.61	Ossett: 53°41′N. 1°35′W. (York) AF
	×	(26.7.61)	Newton Burgoland (Leicester) 68m. S.
0024	f.g.	11.9.60	Sandwich Bay
	×	(27.3.61)	*near* Douai: 50°22′N. 3°05′E. (Nord) **France**

0024 is the first recovery of a British-ringed Moorhen in France.

Coot (*Fulica atra*) (5; 25 miles; 4 4/12 years)

413	pull.	9.7.59	Duddingston Loch: 55°56′N. 3°09′W. (Midlothian) DRA
	/?/	(25.6.61)	*near* Lisburn (Antrim) 145m. SW.
1671	ad.	24.2.57	Abberton
	/?/	0.7.61	Bolsward: 53°04′N. 5°31′E. (Friesland) **Netherlands**
1969	f.g.	18.11.59	Abberton
	+	27.8.61	Pinsk: 52°08′N. 26°06′E. (Brest) **U.S.S.R.**
1058	f.g.	19.2.60	Slimbridge
	×A	19.7.61	Winsford, Middlewich (Cheshire) 100m. N.

Oystercatcher (*Haematopus ostralegus*) (30; 200 miles; 11 years)

1609	pull.	18.6.61	Fair Isle
	+	*c.* 19.8.61	Morecambe Bay (Lancashire) 380m. S.

YD0213	f.g.	24.2.57	Flookburgh: 54°11′N. 2°59′W. (Lancashire) EJMB
	trans.	24.2.57	Slimbridge
	×	21.3.61	*near* Kinaldie (Aberdeen) (=375m. N. of Slimbridge)
3084916	pull.	7.7.61	Newborough: 53°10′N. 4°22′W. (Anglesey) C&T
	+	27.12.61	Chipiona: 36°46′N. 6°26′W. (Cádiz) **Spain**
2023385	pull.	25.6.59	Skokholm
	+	27.2.61	Muros: 42°47′N. 9°04′W. (Coruña) **Spain**

Very few British-ringed Oystercatchers have been recovered in Spain and 3084916 is the southernmost so far.

Lapwing (*Vanellus vanellus*) (59: 10 $\frac{6}{12}$ years)

2030610	pull.	30.5.59	Gladhouse: 55°43′N. 3°09′W. (Midlothian) ATM
	+	(1.1.61)	Clarina (Limerick) 310m. SW.
2008615	pull.	14.5.58	Knaresborough: 54°01′N. 1°28′W. (York) JRM
	×A	5.7.61	Hoorn: 53°26′N. 5°24′E. Terschelling, **Netherlands**
299227	ad.	27.2.58	Abberton
	×	8.4.61	Polotsk: 55°30′N. 28°48′E. (Vitebsk) **U.S.S.R.**

Apart from the above, all the recoveries indicating movements of over 100 miles were reported in December, especially during the cold weather period 25th-31st December. They comprised four movements to Ireland, seven to France (Manche, 1; Finistère, 3; Loire-Atlantique, 3) and one to Vizcaya, Spain. With the exception of one bird from Essex, all had been ringed in Scotland or the north of England.

Ringed Plover (*Charadrius hiaticula*) (6; 10 miles; 1 $\frac{1}{12}$ years)

R58965	pull.	5.8.60	Lochinver: 58°09′N. 5°15′W. (Sutherland) CG
	×	(20.9.61)	Elliott, Arbroath (Angus) 145m. SE.
71286X	juv.	3.9.61	Rathlin Island: 55°17′N. 6°15′W. (Antrim) TE
	+	0.10.61	Brest: 48°23′N. 4°30′W. (Finistère) **France**
27305X	f.g.	24.9.60	Stoke: 51°37′N. 0°38′E. (Kent) NKRG
	+	10.9.61	Esnandes: 46°16′N. 1°05′W. (Charente-Maritime) **France**

Grey Plover (*Charadrius squatarola*) (1; $\frac{1}{12}$ year)

2063034	f.g.	3.10.61	Dunrossness: 59°52′N. 1°17′W. (Shetland) CJB
	+	5.11.61	Bridgemarsh Island (Essex) 570m. SSE.

Golden Plover (*Charadrius apricarius*) (2; 5 miles; 1 $\frac{6}{12}$ years)

P10259	f.g.	1.11.59	Thornham: 52°58′N. 0°36′E. (Norfolk) C&PM
	×	*c.* 24.5.61	Brekken: 62°40′N. 11°50′E. (Sör-Tröndelag) **Norway**

This is the first recovery of a British-ringed Golden Plover in Norway.

Turnstone (*Arenaria interpres*) (6: 50 miles; 1 $\frac{3}{12}$ years)

38826X	f.g.	23.8.60	Tarbat Ness: 57°52′N. 3°46′W. (Ross) AJW
	+	*c.* 4.10.61	Cercal: 37°48′N. 8°40′W. (Baixo Alentejo) **Portugal**
S83524	1stW.	15.9.60	Great Saltee
	+	12.11.61	St. Pol-de-Léon: 48°42′N. 4°00′W. (Finistère) **France**

Snipe (*Gallinago gallinago*) (33; 100 miles; 4 3/12 years)

4431	f.g.	29.10.60	Knaresborough: 54°01′N. 1°28′W. (York) JRM
	+	13.11.61	Le Fleix: 44°52′N. 0°16′E. (Dordogne) **France**
7726	f.g.	31.7.59	Ilkley: 53°56′N. 1°49′W. (York) WNS
	+	1.1.61	*near* Multyfarnham (Westmeath) 226m. W.
1554	f.g.	4.10.59	Ilkley WNS
	+	10.10.61	Randers: 56°28′N. 10°03′E. (Jutland) **Denmark**
28X	f.g.	12.2.61	Killamarsh: 53°19′N. 1°19′W. (Derby) SNHS
	()	27.8.61	Vishera: 58°51′N. 32°13′E. (Novgorod) **U.S.S.R.**
69S	f.g.	16.12.61	Burton Joyce: 52°59′N. 1°02′W. (Nottingham) ARJ
	+	25.12.61	Hendaye: 43°22′N. 1°46′W. (Basses-Pyrénées) **France**
33X	f.g.	20.8.60	*near* Sutton Bridge: 52°44′N. 0°11′E. (Lincoln) M&B
	+	14.1.61	Gemozac: 45°35′N. 0°40′W. (Charente-Maritime) **France**
11021	f.g.	12.8.61	*near* Sutton Bridge C&PM
	+	22.12.61	Oporto: 41°10′N. 8°40′W. (Douro Litoral) **Portugal**
11030	f.g.	13.8.61	*near* Sutton Bridge C&PM
	+	22.12.61	Montoir-de-Bretagne: 47°20′N. 2°08′W. (Loire-Atlantique) **France**
121	f.g.	23.3.60	Cambridge: 52°12′N. 0°07′E. C&PM
	+	29.4.61	Olenino: 56°13′N. 33°29′E. (Kalinin) **U.S.S.R.**
5002	f.g.	23.10.58	Abberton
	+	(16.9.61)	Bostrup: 56°19′N. 9°53′E. (Jutland) **Denmark**
6775	f.g.	2.3.59	Abberton
	+	18.8.61	Axel: 51°16′N. 3°55′E. (Zeeland) **Netherlands**

Jack Snipe (*Lymnocryptes minimus*) (4; 5 miles; 1 2/12 years)

014	f.g.	15.10.60	Stanwell: 51°27′N. 0°29′W. (Middlesex) FKB
	+	24.12.61	La Guerinière: 46°58′N. 2°14′W. (Vendée) **France**

Woodcock (*Scolopax rusticola*) (4; 50 miles; 1 3/12 years)

22	f.g.	16.10.60	Spurn Point
	×	25.7.61	*near* Norberg: 60°04′N. 15°34′E. (Västmanland) **Sweden**

Curlew (*Numenius arquata*) (18; 50 miles; 16 6/12 years)

442	pull.	30.6.61	Loch Pettawater: *c.* 60°22′N. 1°10′W. (Shetland) CJB
	+	10.9.61	Stave: 58°07′N. 6°35′E. (Vest Agder) **Norway**
[illegible]	pull.	24.5.45	*near* Clitheroe: 53°51′N. 2°26′W. (Lancashire) CO
	+	18.11.61	Youghal (Cork) 260m. SW.
[illegible]	f.g.	24.10.57	Hoylake: 53°23′N. 3°11′W. (Cheshire) JCG
	×	18.4.61	Sandö: 60°19′N. 26°17′E. (Uusimaa) **Finland**
7731	pull.	7.7.61	Elvedon: 52°24′N. 0°41′E. (Suffolk) PAB
	+	17.9.61	Férel: 47°29′N. 2°21′W. (Morbihan) **France**
7	f.g.	22.10.60	Harty: 51°22′N. 0°55′E. Sheppey (Kent) NKRG
	+	23.12.61	Gravelines: 50°59′N. 2°08′E. (Nord) **France**

442 and 392506 are the first recoveries of British-ringed Curlews in Fenno-ia.

Bar-tailed Godwit (*Limosa lapponica*) (1; 3 11/12 years)

	ad.	26.9.57	Beadnell: 55°33′N. 1°37′W. (Northumberland) MHBO
	+	6.8.61	Vaerneengene: *c.* 55°54′N. 8°14′E. (Jutland) **Denmark**

Common Sandpiper (*Tringa hypoleucos*) (2; 10 miles; 5 $\frac{11}{12}$ years)

621991	f.g.	13.7.61	Abberton
	v	23.7.61	Tetney Marsh (Lincoln) 12om. NNW.

Redshank (*Tringa totanus*) (19; 150 miles; 1 $\frac{8}{12}$ years)

62438X	pull.	19.5.61	*near* Ilkley: 53°58′N. 1°50′W. (York) CGB
	+	17.7.61	Ouistreham: 49°16′N. 0°15′W. (Calvados) **France**
03741S	pull.	9.6.61	Fairburn: 53°45′N. 1°18′W. (York) AF
	+	26.9.61	Ile d'Oleron: 45°55′N. 1°16′W. (Charente-Maritime) **France**
P10248	1stW.	19.9.59	Holbeach: 52°54′N. 0°04′E. (Lincoln) C&PM
	×	16.5.61	*near* Blairgowrie (Perth) 30om. NW.
P19404	juv.	29.8.61	Dawsmere: 52°51′N. 0°07′E. (Lincoln) WWRG
	+	(21.11.61)	St. Marie du Mont: 49°22′N. 1°14′W. (Manche) **France**
R81484	f.g.	15.8.60	Walberswiek: 52°18′N. 1°41′E. (Suffolk) DBC
	+	*summer* 1961	*near* Varaville: 49°15′N. 0°10′W. (Calvados) **France**
R11330	pull.	1.6.60	Fowley Island: 51°21′N. 0°52′E. (Kent) MWH
	+	12.2.61	*near* Alhandra: 38°56′N. 9°00′W. (Ribatejo) **Portugal**

Knot (*Calidris canutus*) (2; 30 miles; $\frac{7}{12}$ year)

733483	ad.	26.8.60	Dawsmere: 52°51′N. 0°07′E. (Lincoln) WWRG
	×A	(2.1.61)	Greyabbey (Down) 26om. WNW.

Little Stint (*Calidris minuta*) (1; 9 days)

BA03845	f.g.	8.9.61	Dungeness
	v	17.9.61	Selsey Bill (Sussex) 76m. W.

Dunlin (*Calidris alpina*) (36; 25 miles; 4 $\frac{10}{12}$ years)

63607S	f.g.	20.8.61	Delting: *c.* 60°25′N. 1°20′W. (Shetland) CJB
	×	25.9.61	Port Etienne: 20°54′N. 17°01′W. **Mauritania**
S82162	1stW.	14.9.56	*near* Embleton: 55°32′N. 1°37′W. (Northumberland) **MHBO**
	v	15.7.61	Öttenby: 56°13′N. 16°25′E. (Öland) **Sweden**[1]
630179	ad.	1.9.61	Boulmer: 55°25′N. 1°38′W. (Northumberland) MHBO
	v	28.9.61	Sanlúcar: 36°46′N. 6°21′W. (Cádiz) **Spain**
71210X	f.g.	25.8.60	Rathlin: 55°18′N. 6°12′W. (Antrim) TE
	+	*mid* 1.61	Villafranca: 37°10′N. 5°55′W. (Sevilla) **Spain**
71260X	f.g.	25.9.60	Rathlin TE
	v	29.8.61	Dawsmere, Holbeach (Lincoln) 30om. SE.
03646S	ad.	17.8.61	Billingham: 54°36′N. 1°15′W. (Durham) PR
	+	20.8.61	Lezardrieux: 48°47′N. 3°07′W. (Côtes-du-Nord) **France** 42om. SSW.
64422X	f.g.	23.11.60	Spurn Point
	+	20.8.61	*near* Nibe: 56°59′N. 9°39′E. (Jutland) **Denmark**
66993X	f.g.	6.8.60	Shotton: 53°12′N. 3°02′W. (Flint) C&T
	+	11.5.61	St. Froult: 45°56′N. 0°59′W. (Charente-Maritime) **France**
624844	ad.	5.9.59	Holbeach: 52°54′N. 0°04′E. (Lincoln) C&PM
	+	*c.* 10.5.61	Casablanca: 33°39′N. 7°35′W. **Morocco**
627403	ad.	11.8.60	Holbeach WWRG
	+	15.8.61	Vallensbaek: 55°36′N. 12°23′E. (Sjaelland) **Denmark**

[1]Given *Riksmuseum* ring 3019482

447	ad.	26.8.60	Dawsmere: 52°51′N. 0°07′E. (Lincoln) WWRG
	▼	18.8.61	Amager: 55°38′N. 12°34′E. (Sjaelland) **Denmark**[2]
503	ad.	18.8.59	Terrington: 52°47′N. 0°20′E. (Norfolk) WWRG
	+	10.8.61	Rumma: 59°35′N. 25°13′E. (Harju) **Estonian S.S.R.**
434	ad.	18.8.59	Terrington WWRG
	+	20.8.61	*near* Holbaek: 55°43′N. 11°44′E. (Sjaelland) **Denmark**
110	ad.	9.8.60	Terrington WWRG
	/?/	0.8.61	Ringköbing Fjord: *c.* 56°05′N. 8°15′E. (Jutland) **Denmark**
1rX	juv.	31.8.60	Walberswick: 52°18′N. 1°41′W. (Suffolk) DBC
	×	28.7.61	Vallda Sandö: 57°30′N. 11°55′E. (Halland) **Sweden**
917	f.g.	7.10.61	Harty: 51°22′N. 0°55′E. Sheppey (Kent) SWG
	/?/	26.11.61	Oued Akrech: 33°55′N. 6°50′W. Rabat, **Morocco**
02	f.g.	19.11.61	Harty SWG
	+	24.12.61	Narón: 43°31′N. 8°09′W. (Coruña) **Spain**
3X	f.g.	1.10.60	St. Agnes
	+	20.10.60	Esnandes: 46°16′N. 1°05′W. (Charente-Maritime) **France**

[2]Given *Copenhagen* ring 803562

Ruff (*Philomachus pugnax*) (1; $\frac{10}{12}$ year)

3X	f.g. ♂	5.9.60	*near* Sutton Bridge: 52°44′N. 0°11′E. (Lincoln) M&B
	×	(14.7.61)	Kozhva: 65°09′N. 57°00′E. (Komi) **U.S.S.R.**

Stone Curlew (*Burhinus oedicnemus*) (1; $2\frac{4}{12}$ years)

18	pull.	12.6.59	High Wycombe: 51°37′N. 0°53′W. (Buckingham) RFL
	+	14.10.61	*near* Dax: 43°43′N. 1°03′W. (Landes) **France**

Arctic Skua (*Stercorarius parasiticus*) (4; 5 years)

119	pull.	15.7.58	Hermaness: 60°52′N. 0°53′W. (Shetland) RWJS
	+	8.8.60	Atangmik: 64°55′N. 52°00′W. (Godthåb) **Greenland**
6600	pull.	18.7.56	Fair Isle
	×	16.7.61	Foula (Shetland) 45m. NNW.
2358	pull.	17.7.61	Fair Isle
	×	2.9.61	Gossen: 62°48′N. 6°58′E. (Möre-og-Romsdal) **Norway**
5460	pull.	18.7.61	Fair Isle
	×	24.8.61	*near* Dassow: 53°55′N. 10°59′E. (Mecklenburg) **Germany**

Recoveries in Greenland, Norway and Germany are the first records of British-ringed Arctic Skuas in each of those countries.

Great Skua (*Catharacta skua*) (10; 200 miles; $2\frac{1}{12}$ years)

	pull.	23.7.61	Unst: 60°45′N. 0°55′W. (Shetland) FIBO
	×	4.11.61	*near* Cabo Espichel: 38°24′N. 9°13′W. (Estremadura) **Portugal**
59	pull.	29.6.61	Noss: 60°08′N. 1°01′W. (Shetland) DRW
	0	19.11.61	*off* Portimão: *c.* 37°00′N. 8°30′W. (Algarve) **Portugal**
419	pull.	29.6.61	Noss DRW
	+	17.9.61	*near* Moss: 59°29′N. 10°41′E. (Östfold) **Norway**
	pull.	31.7.59	Foula: 60°08′N. 2°05′W. (Shetland) EEJ
	+	(11.1.61)	*off* Fuenterrabia: 43°22′N. 1°48′W. (Guipúzcoa) **Spain**

414396	pull.	8.8.59	Foula JCG
	+	7.7.61	Frederikshåb: 62°05′N. 49°30′W. **Greenland**
415613	pull.	29.7.60	Foula JCG
	×	*c.* 16.1.61	Ancora: 41°48′N. 8°52′W. (Minho) **Portugal**
416027	pull.	24.7.61	Foula BEG
	()	8.12.61	*off* San Vicente: 43°23′N. 4°24′W. (Santander) **Spain**
416105	pull.	1.8.61	Foula BEG
	×	(6.10.61)	*off* Corme: 43°16′N. 8°58′W. (Coruña) **Spain**
416253	pull.	2.8.61	Foula BEG
	+	22.11.61	Marin: 42°23′N. 8°42′W. (Pontevedra) **Spain**

Great Black-backed Gull (*Larus marinus*) (40; 200 miles; 5 $\frac{10}{12}$ years)

413254	pull.	24.6.59	Flannan Isles: 58°16′N. 7°35′W. Outer Hebrides WJE
	()	30.6.61	*off* Lofoten Islands: *c.* 68°00′N. 12°30′E. **Norway**
413847	pull.	5.7.60	Guns Island: 54°17′N. 5°33′W. (Down) JAB
	×	16.4.61	Slapton Ley (Devon) 285m. SSE.
AJ32280	pull.	30.6.61	Rosevear: 49°52′N. 6°24′W. (Scilly) (Cornwall) SABO
	/?/	21.12.61	St. Guénole: 47°49′N. 4°22′W. (Finistère) **France**

413254 is the first Great Black-backed Gull ringed in Britain as pullus to be recovered in Norwegian waters.

Lesser Black-backed Gull (*Larus fuscus*) (109; 5 $\frac{4}{12}$ years)

Table E—Regions and months of recoveries of Lesser Black-backed Gulls

Region of recovery	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Belgium (1)	–	–	1	–	–	–	–	–	–	–	–	
"Biscay" (8)	1	1	3	1	–	(1)	–	–	–	–	1	–
W Spain and Portugal (28)	5	7	4	4	3	2	(2)	–	–	–	–	1
Mediterranean Spain (4)	–	–	–	1	–	2	1	–	–	–	–	–
NW Africa (5)	–	–	2	2	1	–	–	–	–	–	–	–

See footnote to Table A

Herring Gull (*Larus argentatus*) (212; 14 $\frac{10}{12}$ years)

Only eleven recoveries show movements of more than 150 miles and these all conform to a pattern of random southerly dispersal during the autumn and winter.

Common Gull (*Larus canus*) (13; 100 miles; 10 $\frac{2}{12}$ years)

AT69419	pull.	29.6.61	Sullom Voe: *c.* 60°28′N. 1°25′W. (Shetland) CJB
	×	*end* 7.61	Oyne, Inseh (Aberdeen) 215m. S.
3035679	ad.	23.1.59	Avoeh: 57°34′N. 4°10′W. (Ross) JL
	×	29.5.61	Etne: 59°40′N. 5°57′E. (Hordaland) **Norway**
AN6276	ad.	4.4.51	Wallingford: 51°37′N. 1°08′W. (Berkshire) OOS
	×	27.6.61	Skoröy: 70°10′N. 20°00′E. (Troms) **Norway**

Black-headed Gull (*Larus ridibundus*) (257; 10 $\frac{11}{12}$ years)

378759	pull.	17.6.56	Lough Derg: *c.* 52°55′N. 8°20′W. (Clare/Tipperary) DFC
	+	2.11.60	Burgos: 42°21′N. 3°41′W. (Burgos) **Spain**

6978	ad.	19.11.59	Ipswich: 52°04′N. 1°10′E. (Suffolk) PRC
	♂	26.2.61	Faro: 37°01′N. 7°56′W. (Algarve) **Portugal**
649	ad.	15.11.52	St. James's Park: 51°30′N. 0°08′W. (London) TLB
	×	*c.* 25.5.60	Svinö: 60°22′N. 25°40′E. (Uusimaa) **Finland**
11125	ad.	11.1.59	Victoria Embankment: 51°30′N. 0°08′W. (London) ACP
	/?/	0.8.60	Daugavpils: 55°53′N. 26°32′E. **Latvian S.S.R.**
0630	ad.	22.1.58	Chartham: 51°16′N. 1°02′E. (Kent) SBBO
	×	25.6.61	Mastrup: 56°53′N. 9°50′E. (Jutland) **Denmark**
435	1stW.	4.2.56	Sandwich: 51°17′N. 1°20′E. (Kent) DFH
	/?/	18.6.61	Sigtuna: 59°36′N. 17°44′E. (Stockholm) **Sweden**

Twenty-five movements within the British Isles over distances of 100-350 es, and one of 620 miles, show fairly random dispersal with a slight southward dominance.

Kittiwake (*Rissa tridactyla*) (60; 200 miles; 10 years)

1573	pull.	10.7.60	*near* Nigg: 57°41′N. 3°59′W. (Ross) MCWE
	×	12.3.61	Söby: 54°57′N. 10°16′E. Aerö, **Denmark**
9917	ad.	21.6.58	St. Abbs Head: 55°54′N. 2°08′W. (Berwick) IJP
	♂	8.11.61	at sea, NE. of **Iceland**: 66°25′N. 12°50′W.
3317	pull.	29.6.60	North Shields: 55°01′N. 1°26′W. (Northumberland) JCC
	♂	(12.7.61)	Girvan (Ayr) 130m. W.
3368	pull.	29.6.60	North Shields ND&N
	×	24.7.61	Formby (Lancashire) 120m. SW.
7796	ad.	22.7.60	North Shields JCC
	+	8.8.61	Narssaq: 60°00′N. 46°00′W. Julianehåb, **Greenland**
3335	pull.	3.7.60	Scarborough: 54°17′N. 0°24′W. (York) JRM
	♂	5.1.61	**Bay of Biscay**: 43°35′N. 3°15′W.

Nineteen birds ringed on the Farne Islands were recovered as follows:

Ringed		*Recovered*	
771	7.7.56	17.8.60	Qagssimiut: 60°45′N. 47°00′W. Julianehåb **Greenland**
770	10.7.58	15.2.61	Karmöy: *c.* 59°15′N. 5°13′E. (Rogaland) **Norway**
951	18.7.58	9.2.61	Koudekerke: 51°29′N. 3°29′E. (Zeeland) **Netherlands**
760	18.7.58	28.6.59	Amerdloq Fjord: *c.* 66°50′N. 53°15′W. **Greenland**
783	18.7.59	24.8.60	Narssalik: 61°45′N. 49°20′W. Julianehåb, **Greenland**
769	19.7.58	20.5.61	Brancaster (Norfolk) 200m. SE.
884	26.6.59	20.5.61	Lowestoft (Suffolk) 250m. SE.
789*	27.6.59	25.3.61	St. Osyth (Essex) 280m. SSE.
733	22.7.59	30.7.61	Nanortalik: 60°10′N. 45°05′W. Julianehåb, **Greenland**
747	22.7.59	31.1.61	Aughadown, Skibbereen (Cork) 420m. SW.
711	9.7.60	(12.2.61)	Brewood (Stafford) 200m. S.
739	9.7.60	8.4.61	Minsmere (Suffolk) 260m. SE.
729	14.7.60	14.7.61	Girvan (Ayr) 125m. W.
759	14.7.60	1.7.61	St. George's Channel: 51°10′N. 8°10′W.
747	14.7.60	19.11.61	Renesse: 51°44′N. 3°46′E. (Zeeland) **Netherlands**
714	14.7.60	15.8.61	St. Servan: 48°38′N. 2°00′W. (Ille-et-Vilaine) **France**
769	15.7.60	(5.4.61)	Emstek: 52°49′N. 8°08′E. (Niedersachsen) **Germany**
733	2.8.60	7.2.61	**Bay of Biscay**: 45°20′N. 1°50′W.
705	1.7.61	*c.* 10.11.61	Heligoland: 54°11′N. 7°55′E. **Germany**

*Ringed as adult; the remainder were ringed as pulli

Common Tern (*Sterna hirundo*) (47; 150 miles; 6 years)

732829	pull.	24.7.61	Coquet Island: 55°20′N. 1°32′W. (Northumberland) JCC
	+	(26.10.61)	Marbella: 36°31′N. 4°53′W. (Málaga) **Spain**
34013X	pull.	5.6.60	Lough Neagh: *c.* 54°32′N. 6°31′W. (Armagh) TE
	×	30.4.61	M'Bour: 14°22′N. 16°54′W. **Sénégal**
S17179	pull.	30.7.55	Rye Harbour: 50°56′N. 0°46′E. (Sussex) DBO
	×	1.8.61	Knardijk: 52°24′N. 5°32′E. Oost-Flevoland, **Netherlands**

Eleven birds were recovered on the Guinea Coast between 2°53′W. and 2°31′E. (Ghana, 8; Togo, 2; Dahomey, 1); the months of recovery being: November, 2; December, 1; January, 1; February, 2; March, 1; April, 1; (June, 2); and September, 1.

Arctic Tern (*Sterna macrura*) (82; 150 miles; 22 years)

X23880	pull.	9.7.52	Tentsmuir: 56°27′N. 2°49′W. (Fife) JG
	×	2.7.61	Foulney Island (Lancashire) 160m. S.
61482X	pull.	9.7.60	(Anglesey) C&T
	v	18.4.61	Coffee Bay: 31°59′S. 29°08′E. (Cape of Good Hope) **South Africa**

Twelve birds ringed on the Farne Islands were recovered as follows:

Ringed		*Recovered*	
X88062	16.7.54	16.8.61	Linne: 51°10′N. 5°56′E. (Limburg) **Netherlands**
CK02293	24.6.61	5.9.61	*near* Bilbao: *c.* 43°40′N. 3°00′W. (Vizcaya) **Spain**
CK03289	15.7.61	5.9.61	*near* Bilbao, **Spain**
*705431**	4.7.59	25.8.61	Freetown: 8°30′N. 13°17′W. **Sierra Leone**
V93068	18.7.58	*c.* 4.9.61	Port Loko: 8°50′N. 12°50′W. **Sierra Leone**
V48886*	20.7.57	23.8.61	Monrovia: 6°20′N. 10°46′W. **Liberia**
732174	23.7.60	(10.8.61)	Keta: 5°55′N. 1°01′E. **Ghana**
CK03976	24.6.61	4.11.61	Contonou: 6°24′N. 2°31′E. **Dahomey**
CK02361	23.6.61	30.10.61	*near* Quibala: *c.* 10°55′S. 14°50′E. **Angola**
CK04545	1.7.61	14.10.61	Luanda: 8°50′S. 13°15′E. **Angola**
730271	7.7.60	5.11.61	Richard's Bay: 28°50′S. 32°02′E. (Zululand) **South Africa**
730751	9.7.60	8.7.61	Transkei: *c.* 32°25′S. 28°40′E. (Cape of Good Hope) **South Africa**

*Ringed as adult; the remainder were ringed as pulli

Roseate Tern (*Sterna dougallii*) (23; 10 miles; $\frac{11}{12}$ year)

Table F—Countries and months of recoveries of Roseate Terns

Country of recovery	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Portugal (1)	1	–	–	–	–	–	–	–	–	–	–	–
Morocco (1)	1	–	–	–	–	–	–	–	–	–	–	–
Liberia (2)	–	–	–	–	1	–	–	1	–	–	–	–
Ivory Coast (2)	–	–	–	–	–	1	–	–	1	–	–	–
Ghana (12)	1	–	6	–	2	3	–	–	–	–	–	–
Nigeria (1)	–	–	–	–	1	–	–	–	–	–	–	–

See footnote to Table A

Sandwich Tern (*Sterna sandvicensis*) (74; 150 miles; 6 years)

Recoveries showing an apparent change of breeding colony (marked *) and recoveries in the Mediterranean are given in full. Thirty-two other foreign recoveries are summarised in Table G.

*5377	pull.	11.7.58	Firth of Forth: *c.* 56°02′N. 3°08′W. WJE
	()	13.7.61	Valras: 43°16′N. 3°18′E. (Hérault) **France**
*5401	pull.	17.7.58	Firth of Forth MOC
	()*	25.5.61	Griend: 53°16′N. 5°15′E. Waddenzee, **Netherlands**
*5396	pull.	24.7.58	Firth of Forth MOC
	+	20.6.61	*near* Vecchiano: 43°46′N. 10°12′E. (Toscana) **Italy**
*00418	pull.	8.7.56	Farne Islands
	× *	15.7.61	Aberlady Bay: (East Lothian) 53m. WNW.
*06568	pull.	29.6.57	Farne Islands
	v*	19.6.61	Ravenglass (Cumberland) 110m. SW.
*7904	pull.	6.7.60	Farne Islands
	×	23.3.61	Alger: 36°50′N. 3°00′E. **Algeria**
*8853	pull.	22.6.61	Farne Islands
	/?/	15.12.61	Cabo Cullera: 39°11′N. 0°14′W. (Valencia) **Spain**

Table G—Countries and months of recoveries of Sandwich Terns

ntry of recovery	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
ice (3)	3	–	–	–	–	–	–	–	–	–	–	–
pain (3) and ortugal (1)	2	2	–	–	–	–	–	–	–	–	–	–
occo (1)	1	–	–	–	–	–	–	–	–	–	–	–
égal (6) and ort. Guinea (1)	–	–	1	–	1	1	1	2	1	–	–	–
ra Leone (3) and beria (2)	–	–	1	–	–	1	2	1	–	–	–	–
y Coast (5)	–	–	2	–	–	–	–	–	2	(1)	–	–
na (5)	–	1	1	–	3	–	–	–	–	–	–	–
ola (2)	–	–	–	–	–	–	–	–	–	2	–	–

See footnote to Table A

Razorbill (*Alca torda*) (28; 75 miles; 7 years)

667631	pull.	30.6.61	Fair Isle
	+	2.10.61	Boknfjorden: *c.* 59°10′N. 5°30′E. (Rogaland) **Norway**
667651	pull.	1.7.61	Fair Isle
	+	29.9.61	Boknfjorden, **Norway**
10851	pull.	2.7.60	Sheep Island: 55°16′N. 6°21′W. (Antrim) JAB
	/?/	15.2.61	**Bay of Biscay**: 43°30′N. 1°56′W.

Birds ringed at Durness, 58°34′N. 4°44′W. (Sutherland), were recovered as cows:

Ringed		*Recovered*	
.0021	29.6.61	6.10.61	Flekkefjord: 58°15′N. 6°35′E. (Vest Agder) **Norway**
1962	29.6.61	30.9.61	Haugesund: 59°25′N. 5°16′E. (Rogaland) **Norway**
7886	30.6.61	0.8.61	Boknfjorden, **Norway**
*7888	30.6.61	10.11.61	Boknfjorden, **Norway**
*7889	30.6.61	20.10.61	Boknfjorden, **Norway**
*7895	30.6.61	28.10.61	*off* Cabo Higuer: 43°24′N. 1°48′W. (Guipùzcoa) **Spain**
*7896	30.6.61	28.9.61	Boknfjorden, **Norway**

*Ringed as adult; the remainder were ringed as pulli

Birds ringed as pulli on the Isle of Man were recovered as follows:

Ringed		*Recovered*	
AT69517	24.6.60	16.1.61	Diano Marina: 43°55′N. 8°05′E. (Imperia) **Italy**
3076001	11.6.59	14.1.61	Kimmeridge Bay (Dorset) 260m. SE.
3076080	18.6.59	20.10.61	*off* Eigeröy: 58°26′N. 5°50′E. (Rogaland) **Norway**
3084563	16.7.61	20.11.61	Fouesnant: 47°54′N. 4°00′W. (Finistère) **France**

Birds ringed as pulli on Skokholm and Skomer were recovered as follows:

Ringed		*Recovered*	
AT29447	30.6.55	16.2.61	St. Jean de Luz: 43°23′N. 1°39′W. (Basses-Pyrénées) **France**
3053727	9.7.58	3.10.61	Askvoll: 61°21′N. 5°04′E. (Sogn-og-Fjordane) **Norway**
3064765	17.6.59	15.2.61	Cabo da Roca: 38°46′N. 9°30′W. (Estremadura) **Portugal**
3064881	23.6.59	2.1.61	Walney Island (Lancashire) 180m. NE.
AT66141	28.6.60	13.2.61	Cabo Higuer: 43°24′N. 1°48′W. (Guipúzcoa) **Spain**
AT66195	29.6.60	5.2.61	Bexhill-on-Sea (Sussex) 255m. ESE.
AT66208	29.6.60	0.11.61	Plencia: 43°24′N. 2°56′W. (Vizcaya) **Spain**
3075267	10.7.60	5.11.61	*off* Listad: *c.* 57°50′N. 6°20′E. (Vest Agder) **Norway**

Guillemot (*Uria aalge*) (16; 100 miles; 2 6/12 years)

AT67135	pull.	7.7.60	Fair Isle
	+	7.1.61	*near* Kvitsöy: *c.* 58°58′N. 5°24′E. (Rogaland) **Norway**
AT77206	pull.	12.7.61	Fair Isle
	+	29.9.61	Boknfjorden: *c.* 59°10′ N. 5°30′E. (Rogaland) **Norway**
3048602	ad.	29.6.58	Sula Sgeir: 59°06′N. 6°10′W. Outer Hebrides TBB
	+	5.1.61	Hvaler: 59°07′N. 10°55′E. Oslofjord, **Norway**
AT69609	pull.	26.6.60	Calf of Man: 54°03′N. 4°49′W. CMRS
	×	14.1.61	Deal (Kent) 320m. SE.
AJ32243	pull.	29.6.61	Gorregan: 49°52′N. 6°23′W. Scilly (Cornwall) SABO
	+	7.11.61	Pasajes: 43°20′N. 1°55′W. (Guipúzcoa) **Spain**

Five birds ringed as pulli on the Farne Islands were recovered as follows:

Ringed		*Recovered*	
AT51536	22.7.59	28.1.61	Hastings (Sussex) 340m. SSE.
AJ37885	6.7.60	21.12.61	Heligoland: 54°11′N. 7°55′E. **Germany**
AJ37503	1.7.61	22.11.61	*off* Arendal: 58°27′N. 8°56′E. (Aust Agder) **Norway**
AJ37578	1.7.61	5.12.61	Langesund: 59°00′N. 9°50′E. (Telemark) **Norway**
AJ37752	31.7.61	11.11.61	Kvitsöy: 59°04′N. 5°26′E. (Rogaland) **Norway**

Puffin (*Fratercula arctica*) (6; 175 miles; 4 3/12 years)

2059853	pull.	20.6.61	Farne Islands
	×	(18.8.61)	*near* Nymindegab: *c.* 55°55′N. 8°10′E. (Jutland) **Denmark**

Woodpigeon (*Columba palumbus*) (94; 70 miles; 6 4/12 years)

3087534	pull.	25.9.61	Weston Colville: 52°09′N. 0°20′E. (Cambridge) MAFF
	+	3.12.61	Marquise: 50°48′N. 1°42′E. (Pas-de-Calais) **France**
3059915	pull.	4.6.61	Elmers End: 51°24′N. 0°03′W. (Kent) PM
	+	11.11.61	Riaillé: 47°32′N. 1°18′W. (Loire-Atlantique) **France**

Turtle Dove (*Streptopelia turtur*) (4; 11/12 year)

2019425	ad.	9.5.61	Stonebridge: 52°27′N. 1°41′W. (Warwickshire) JFWB
	+	6.9.61	Arronches: 39°08′N. 7°16′W. (Alto Alentejo) **Portugal**

119428	pull.	1.8.61	Stonebridge JFWB
	+	1.10.61	Puerto de Santa Maria: 36°36′N. 6°14′W. (Cádiz) **Spain**
657205	pull.	30.7.61	Foulness: 51°36′N. 0°55′E. (Essex) GD
	+	13.9.61	*near* Cozes: 45°35′N. 0°50′W. (Charente-Maritime) **France**
33847	1stW.	16.9.60	Dungeness
	+	28.8.61	Cap Ferret: 44°42′N. 1°16′W. (Gironde) **France**

Cuckoo (*Cuculus canorus*) (8; 5 miles; $3\frac{10}{12}$ years)

c?335	juv.	20.7.61	Bardsey
	+	*c.* 15.8.61	*near* Lille: 50°39′N. 3°05′E. (Nord) **France**
7:224	juv.	5.8.57	Beddington: 51°23′N. 0°08′W. (Surrey) LNHS
	×	(27.6.61)	Stockport (Cheshire) 155m. NW.
38864	1stW.	8.8.59	Dungeness
	×	(15.7.61)	*near* Amiens: *c.* 49°57′N. 2°27′E. (Somme) **France**
38855	juv.	26.7.61	Dungeness
	×	8.9.61	Klein Auheim: 50°06′N. 8°56′E. (Hessen) **Germany**

Barn Owl (*Tyto alba*) (10; 20 miles; $1\frac{5}{12}$ years)

HI8539	pull.	17.6.61	Burneside: 54°21′N. 2°46′W. (Westmorland) JWA
	×	21.11.61	Tean, Cheadle (Stafford) 100m. SSE.

Long-eared Owl (*Asio otus*) (7; 50 miles; 5 years)

HI2411	f.g.	15.11.59	Newburgh: 57°19′N. 2°01′W. (Aberdeen) EAG
	×	29.8.61	*near* Stade: *c.* 53°34′N. 9°37′E. (Niedersachsen) **Germany**

This is only the second British-ringed Long-eared Owl to be recovered abroad, the previous one being in Norway.

Short-eared Owl (*Asio flammeus*) (3; 100 miles; $2\frac{3}{12}$ years)

HI2409	pull.	27.5.59	Newburgh: 57°19′N. 2°01′W. (Aberdeen) EAG
	×	19.9.61	Kilbarchan (Renfrew) 135m. SW.
11806	juv.	4.6.61	Foulness: 51°36′N. 0°55′E. (Essex) PER
	×	25.12.61	Handzame: 51°02′N. 3°00′E. (West Flanders) **Belgium**

Previous foreign recoveries of British-ringed Short-eared Owls are from Spain (1), Malta (1) and France (1).

Swift (*Apus apus*) (64; 50 miles; $9\frac{11}{12}$ years)

6600	ad.	19.5.61	Milton: 52°14′N. 0°09′E. (Cambridge) CMR
	×	1.7.61	Binbrook (Lincoln) 80m. N.
4444	ad.	13.7.57	Beddington: 51°23′N. 0°08′W. (Surrey) LNHS
	v	3.5.61	Saurat: 42°52′N. 1°31′E. (Ariège) **France**
3:043	ad.	11.6.61	Beddington LNHS
	×	20.8.61	Paiporta: 39°26′N. 0°25′W. (Valencia) **Spain**

Green Woodpecker (*Picus viridis*) (5; 5 miles; $2\frac{6}{12}$ years)

155	juv. ♀	27.7.60	Minsmere: 52°14′N. 1°37′E. (Suffolk) HEA
	×	(20.2.61)	*near* Norwich (Norfolk) 30m. NNW.

Great Spotted Woodpecker (*Dendrocopos major*) (6; 5 miles; $4\frac{10}{12}$ years)

4412	ad. ♂	8.10.61	Gibraltar Point
	×	14.10.61	North Cockerington (Lincoln) 23m. NNW.

Swallow (*Hirundo rustica*) (106; 200 miles; $3\frac{3}{12}$ years)

AA95953	pull.	5.8.61	*near* Lockerbie: 55°08′N. 3°24′W. (Dumfries) RTS
	v	17.9.61	Stibbington (Huntingdon) 210m. SE.
J82217	ad.	21.5.60	Copeland
	v	(25.7.61)	Gowerton (Glamorgan) 215m. SSE.
AB94321	pull.	31.7.61	Tholthorpe: 54°06′N. 1°16′W. (York) SPS
	×	26.10.61	St. Martory: 43°09′N. 0°56′E. (Haute-Garonne) **France**
AA73188	juv.	6.8.60	Fairburn: 53°45′N. 1°18′W. (York) CW
	×	(16.1.61)	Vryheid: 27°45′S. 30°48′E. (Natal) **South Africa**
AA94225	ad.	15.9.60	Fairburn CW
	×	20.12.61	Dewetsdorp: 29°35′S. 26°40′E. (Orange Free State) **South Africa**
AC34929	ad.	4.9.61	Fairburn CW
	v	25.9.61	Gaurain-Ramecroix: 50°35′N. 3°29′E. (Hainaut) **Belgium**[1]
AC46647	ad.	23.9.61	Fairburn CW
	×	8.10.61	St. Yrieix-la-Perche: 45°31′N. 1°12′E. (Haute-Vienne) **France**
K77977	ad. ♀	30.5.59	Spurn Point
	+	*c.* 15.5.61	San Bartolomeo: 43°56′N. 8°07′E. (Imperia) **Italy**
J93009	pull.	8.6.60	Newcastle-under-Lyme: 53°02′N. 2°18′W. (Stafford) JN
	()	22.4.61	**Gulf of Genoa**: *c.* 44°00′N. 9°00′E.
J59228	juv.	28.8.59	Nuneaton: 52°29′N. 1°28′W. (Warwick) JW
	×	11.1.61	*near* Johannesburg: 26°00′S. 28°08′E. (Transvaal) **South Africa**
AA90409	juv.	29.9.60	Nuneaton BJT
	v	12.6.61	Douglas (Lanark) 230m. NNW.
H68531	juv.	17.9.61	King's Norton: 52°24′N. 1°56′W. (Warwick) C&PM
	×	(2.10.61)	Vallecrosia: 43°48′N. 7°39′E. (Imperia) **Italy**
H33328	juv.	29.8.60	Benacre: 52°21′N. 1°43′E. (Suffolk) H&W
	×	10.2.61	Cedarville: 30°23′S. 29°03′E. (Cape of Good Hope) **South Africa**
AC1500–	juv.	27.8.61	Cassington: 51°47′N. 1°21′W. (Oxford) OOS
	v	7.9.61	St. Pryve-St. Mesmin: 47°54′N. 1°50′E. (Loiret) **France**
K45340	juv.	21.9.58	Bradwell
	v (=♀)	(29.5.61)	Warcop, Appleby (Westmorland) 240m. NW.
AA86276	1stW.	12.9.60	Sandwich
	v (=♀)	19.9.61	Fairburn (Yorkshire) 200m. NW.

[1]Given *Bruxelles* ring 35A2382

House Martin (*Delichon urbica*) (22; 150 miles; $3\frac{1}{12}$ years)

K26569	ad.	11.6.58	Harrogate: 53°59′N. 1°33′W. (York) S&W
	× (=♂)	15.6.61	Texel: 53°03′N. 4°47′E. **Netherlands**
88291	juv.	20.9.60	Folkestone: 51°05′N. 1°11′E. (Kent) F&M
	v	26.5.61	Dunsville, Doncaster (York) 190m. NW.
AA06119	1st W.	24.9.60	Selsey Bill: 50°43′N. 0°47′W. (Sussex) BAEM
	v	10.7.61	Garelochhead (Dumbarton) 400m. NW.

Sand Martin (*Riparia riparia*) (266; 200 miles; 5 years)

AA35666	juv.	25.6.61	Kincraig: 57°08′N. 3°56′W. (Inverness) C&L
	v	25.7.61	Elm Park, Romford (Essex) 420m. SE.

127685	juv.	10.7.61	Knaresborough: 54°01′N. 1°28′W. (York) JRM
	▼	30.7.61	Littlebourne (Kent) 215m. SE.
A97092	juv.	6.7.61	Castley: 53°54′N. 1°38′W. (York) F&L
	▼	17.7.61	Elm Park, 175m. SSE.
A90880	juv.	11.9.60	Fairburn: 53°45′N. 1°18′W. (York) CW
	×	*mid* 3.61	San Jaime: 40°43′N. 0°42′E. (Tarragona) **Spain**
A90960	juv.	17.9.60	Fairburn CW
	v	26.6.61	Kincraig (Inverness) 250m. NNW.
	v	2.7.61	Kincraig
H26927	juv.	1.7.61	Papplewick: 53°03′N. 1°11′W. (Nottingham) JASB
	▼	17.7.61	Elm Park 117m. SE.
C12813	ad.	6.8.61	Bawsey: 52°45′N. 0°26′E. (Norfolk) JHP
	+	3.9.61	Las Cabezas: 36°59′N. 5°56′W. (Sevilla) **Spain**
27747	juv.	28.7.60	Rothley: 52°43′N. 1°08′W. (Leicester) RAOH
	×	0.8.61	Bordeaux: *c.* 44°50′N. 0°35′W. (Gironde) **France**
22876	juv.	6.9.60	Pymore: 52°28′N. 0°15′E. (Cambridge) M&B
	×	10.5.61	Glespin, Douglas (Lanark) 270m. NW.
8164052	ad.	16.7.61	West Stow: 52°18′N. 0°40′E. (Suffolk) M&B
	×	(7.10.61)	Novillas: 41°56′N. 1°24′W. (Zaragoza) **Spain**
166693	juv.	20.8.61	Abberton
	+	0.11.61	Anglet: 43°29′N. 1°30′W. (Basses-Pyrénées) **France**
8993153	juv.	23.7.61	Sevenoaks: 51°16′N. 0°12′E. (Kent) J&JH
	v	7.8.61	St. Pryve-St. Mesmin: 47°54′N. 1°50′E. (Loiret) **France**
8779965	juv.	6.7.61	Dorking: 51°14′N. 0°20′W. (Surrey) W&W
	v	7.8.61	St. Pryve-St. Mesmin, **France**
A550631	juv.	24.7.60	Kennington: 51°10′N. 0°54′E. (Kent) SBBO
	v	19.5.61	Masham (York) 240m. NNW.
8896496	ad.	3.8.61	Coates: 50°59′N. 0°38′W. (Sussex) W&W
	×	21.9.61	Arcos: 36°45′N. 5°48′W. (Cádiz) **Spain**

A97092 and H26927 are included as indications of how early the autumn migration may begin.

Rook (*Corvus frugilegus*) (39; 25 miles; 8 $\frac{1}{12}$ years)

44161	ad.	8.11.61	Spurn Point
	+	7.12.61	Sporle, Swaffham (Norfolk) 68m. SSE.

Jackdaw (*Corvus monedula*) (21; 15 miles; 6 years)

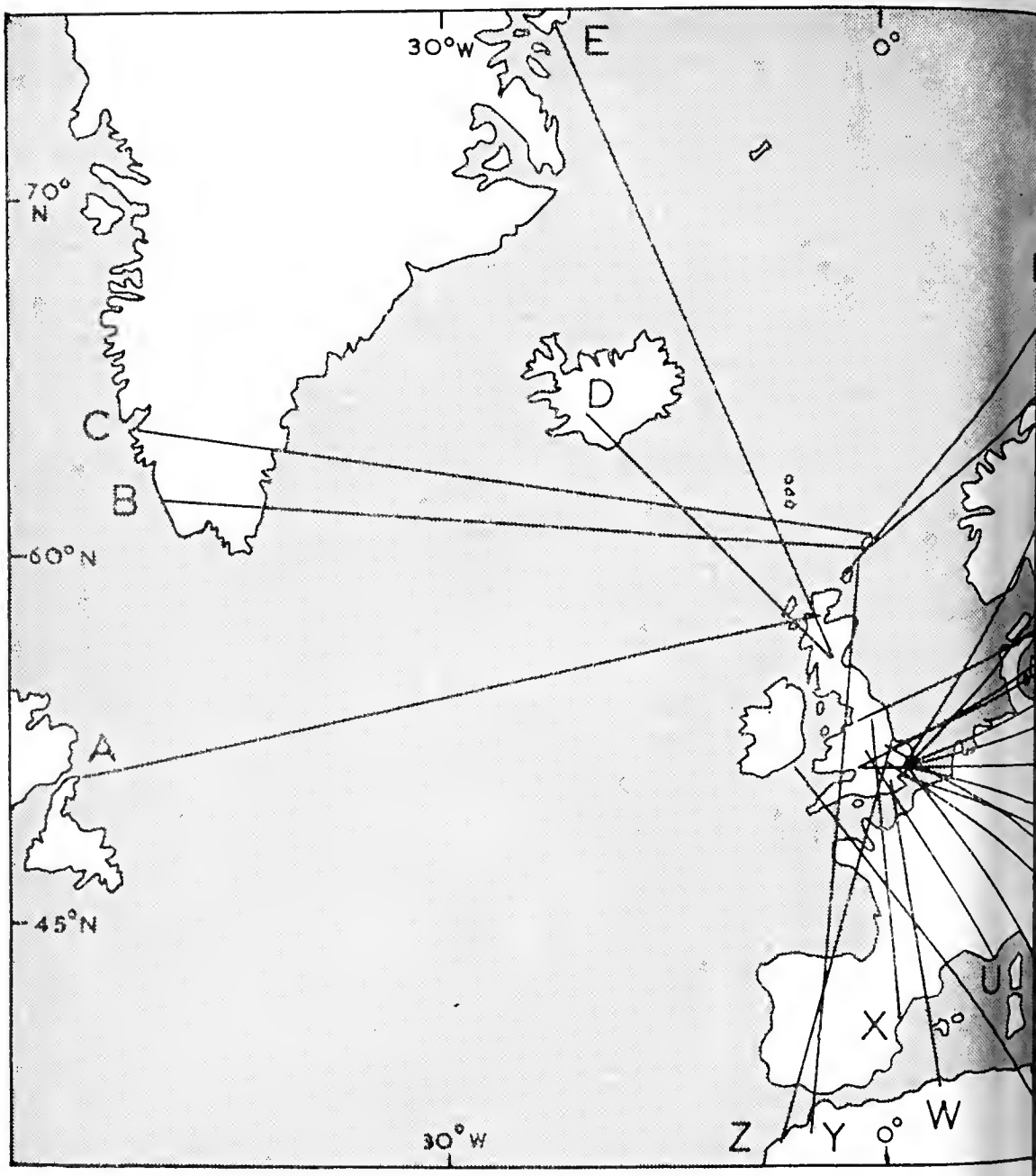
11351	ad.	16.7.60	Copeland
	×	4.7.61	Timahoe (Kildare) 100m. SSW.

Great Tit (*Parus major*) (154; 15 miles; 10 years)

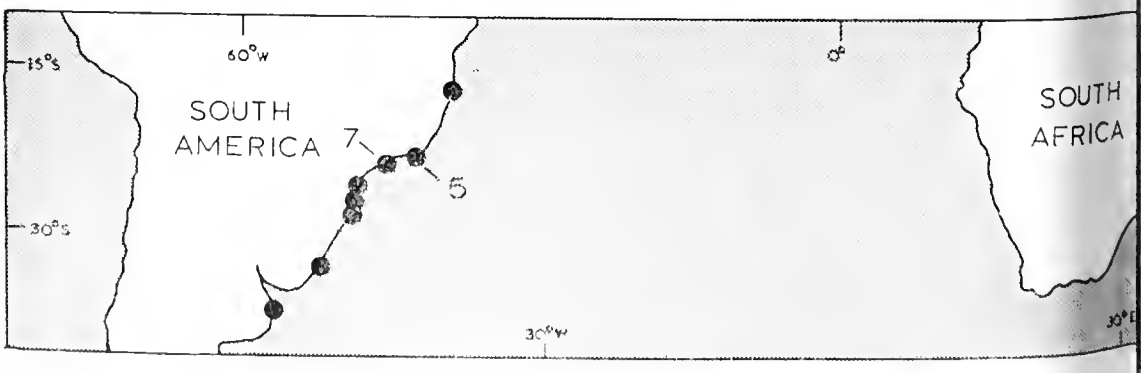
101462	f.g.	22.2.61	St. Albans: 51°46′N. 0°20′W. (Hertford) MEG
	×	(27.9.61)	Headington (Oxford) 36m. W.

Blue Tit (*Parus caeruleus*) (375; 30 miles; 8 $\frac{9}{12}$ years)

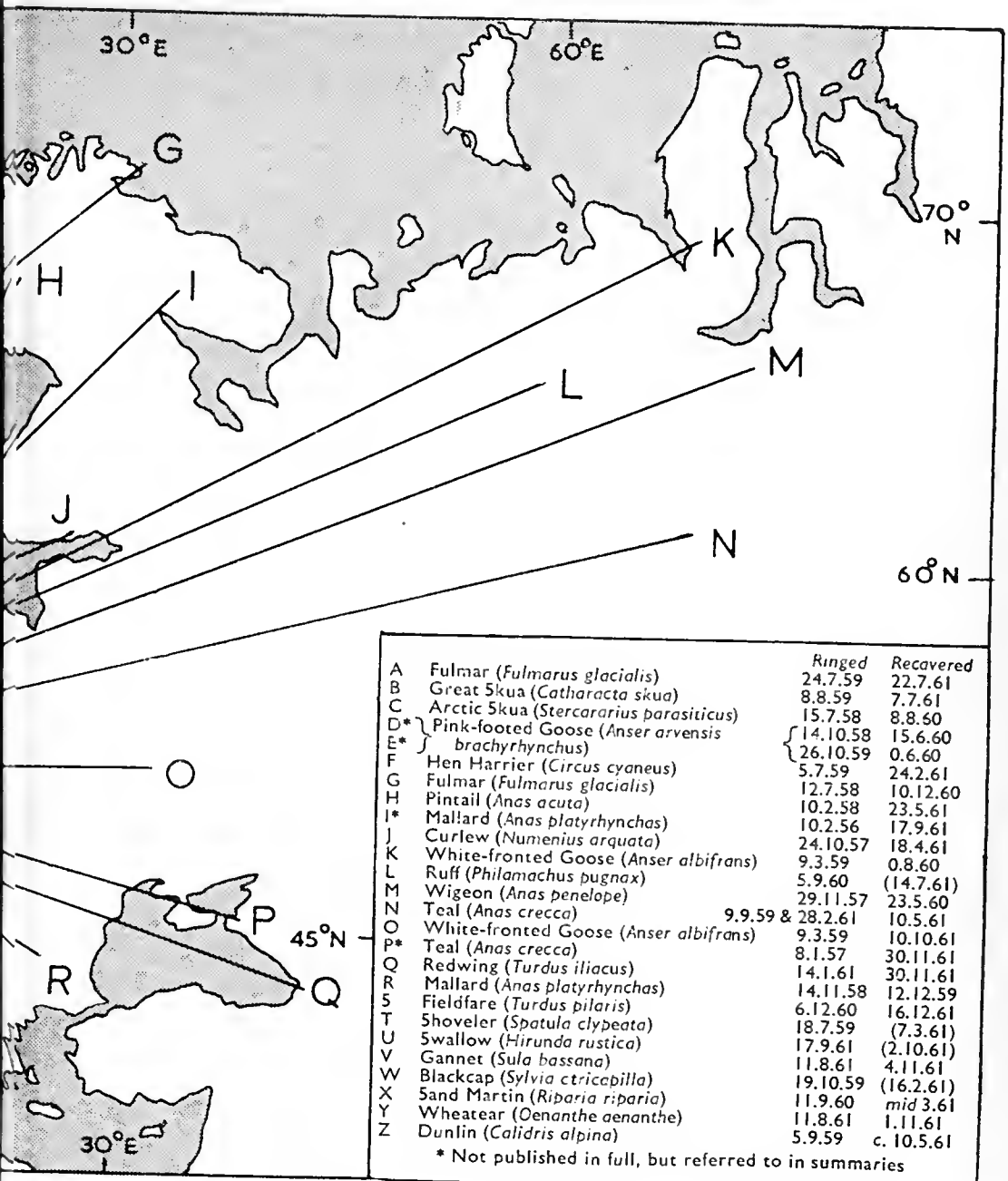
9965	f.g. ♂	9.2.58	Jordanhill: 55°33′N. 4°21′W. (Lanark) WUF
	×	(22.2.61)	Glen Shira (Argyll) 36m. NW.
111485	1stW.	10.3.61	Nantwich: 53°04′N. 2°31′W. (Cheshire) AWG
	×	23.5.61	Littleover (Derby) 40m. ESE.



Map 1. Some notable r



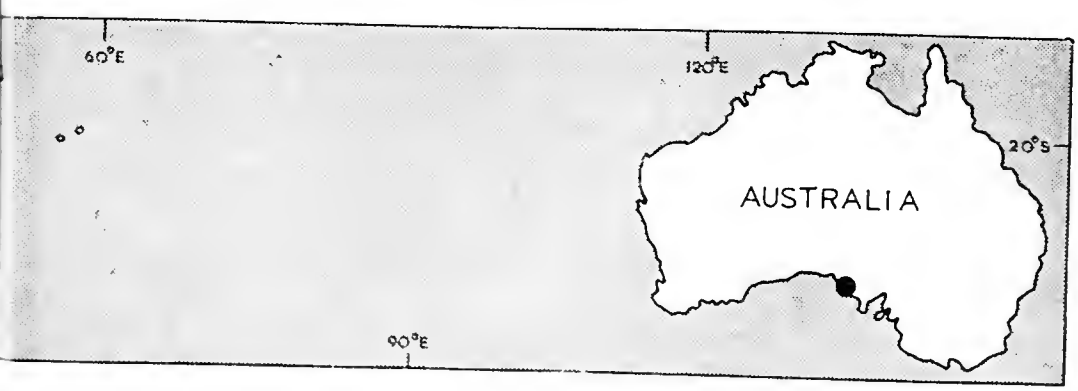
Map 2. Recoveries of Manx Shearwaters (*Procellaria puffi*



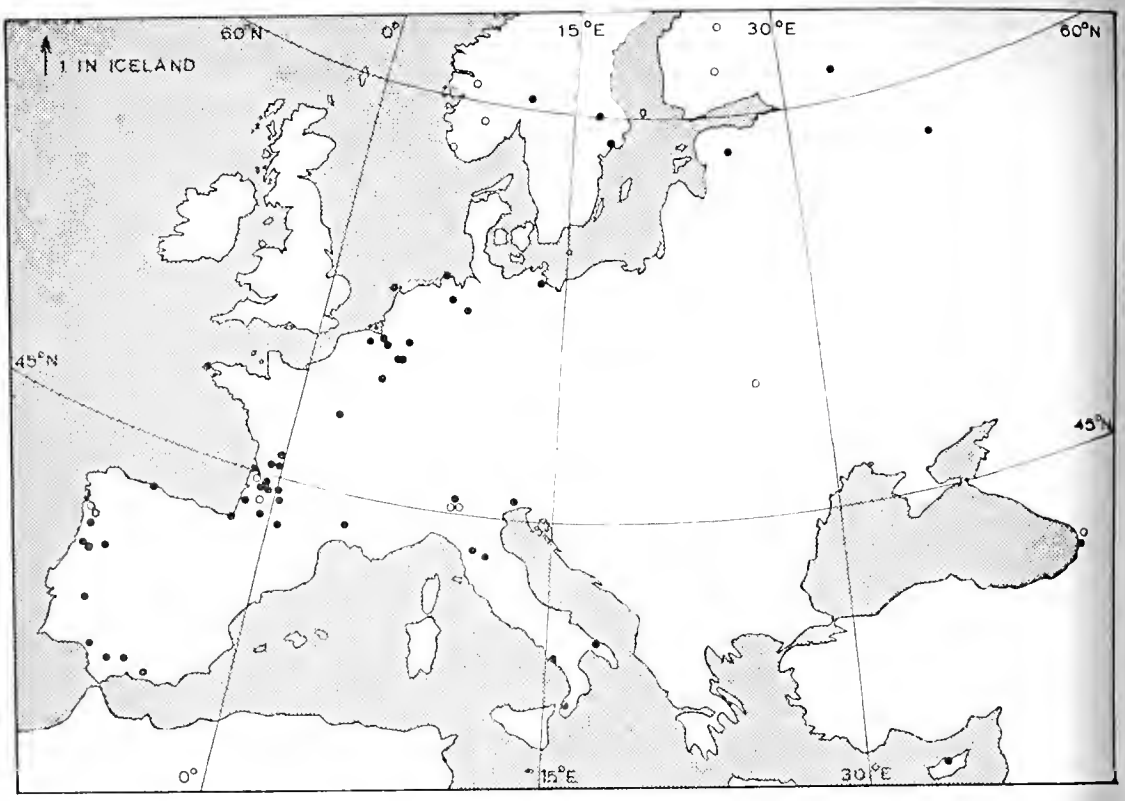
		Ringed	Recovered
A	Fulmar (*Fulmarus glacialis*)	24.7.59	22.7.61
B	Great Skua (*Catharacta skua*)	8.8.59	7.7.61
C	Arctic Skua (*Stercorarius parasiticus*)	15.7.58	8.8.60
D*	Pink-footed Goose (*Anser arvensis brachyrhynchus*)	14.10.58	15.6.60
E*		26.10.59	0.6.60
F	Hen Harrier (*Circus cyaneus*)	5.7.59	24.2.61
G	Fulmar (*Fulmarus glacialis*)	12.7.58	10.12.60
H	Pintail (*Anas acuta*)	10.2.58	23.5.61
I*	Mallard (*Anas platyrhynchas*)	10.2.56	17.9.61
J	Curlew (*Numenius arquata*)	24.10.57	18.4.61
K	White-fronted Goose (*Anser albifrans*)	9.3.59	0.8.60
L	Ruff (*Philamachus pugnax*)	5.9.60	(14.7.61)
M	Wigeon (*Anas penelope*)	29.11.57	23.5.60
N	Teal (*Anas crecca*)	9.9.59 &	28.2.61 10.5.61
O	White-fronted Goose (*Anser albifrans*)	9.3.59	10.10.61
P*	Teal (*Anas crecca*)	8.1.57	30.11.61
Q	Redwing (*Turdus iliacus*)	14.1.61	30.11.61
R	Mallard (*Anas platyrhynchas*)	14.11.58	12.12.59
S	Fieldfare (*Turdus pilaris*)	6.12.60	16.12.61
T	Shoveler (*Spatula clypeata*)	18.7.59	(7.3.61)
U	Swallow (*Hirunda rustica*)	17.9.61	(2.10.61)
V	Gannet (*Sula bassana*)	11.8.61	4.11.61
W	Blackcap (*Sylvia ctricapilla*)	19.10.59	(16.2.61)
X	Sand Martin (*Riparia riparia*)	11.9.60	*mid* 3.61
Y	Wheatear (*Oenanthe oenanthe*)	11.8.61	1.11.61
Z	Dunlin (*Calidris alpina*)	5.9.59	*c.* 10.5.61

* Not published in full, but referred to in summaries

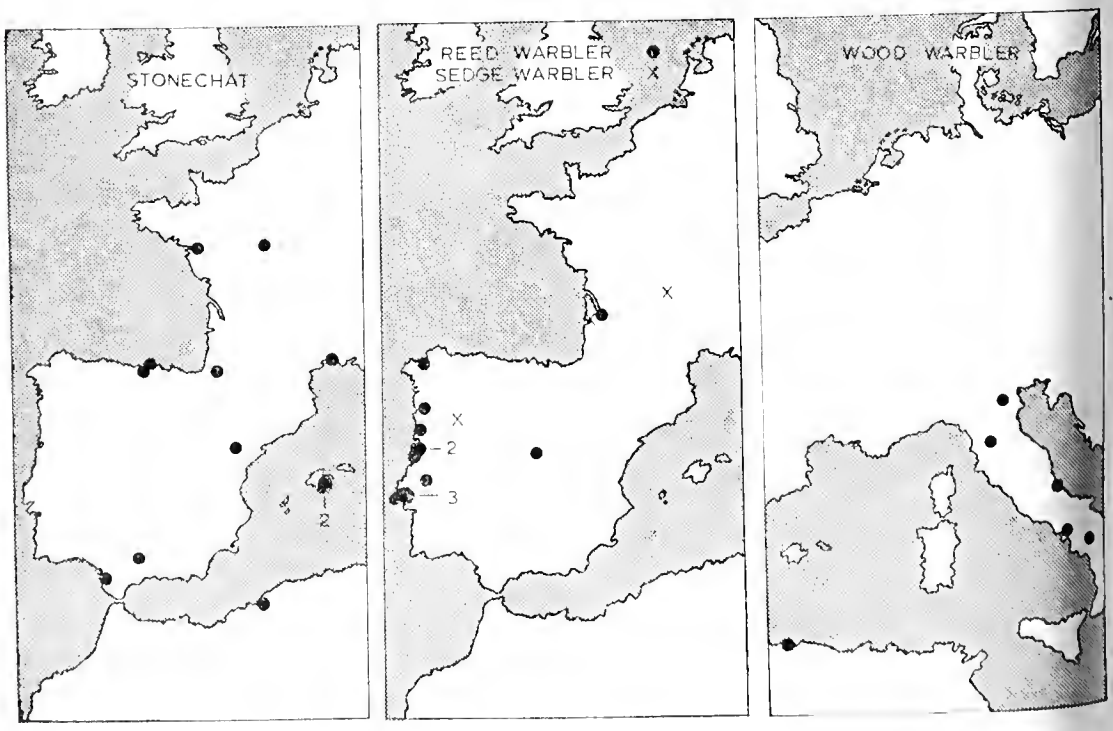
recoveries



thern hemisphere reported by 31st December 1961



Map 3. Recoveries of Redwings (*Turdus iliacus*) reported by 31st December 1961, those reported during 1961 being shown by open circles and earlier ones by black circles



Map 4. Foreign recoveries of Stonechats (*Saxicola torquata*), Reed and Sedge Warblers (*Acrocephalus scirpaceus* and *schoenobaenus*) and Wood Warblers (*Phylloscopus sibilatrix*) reported by 31st December 1961

209547	f.g.	6.12.60	Hadley: 52°43′N. 2°29′W. (Shropshire) FBC
	v	19.2.61	Groby (Leicester) 52m. E.
3367	f.g.	7.1.60	Acton: 51°31′N. 0°16′W. (Middlesex) MW
	×	(18.9.61)	Bedford 42m. N.
11147	juv.	3.7.61	Sonning Common: 51°29′N. 0°56′W. (Oxford) HMD
	×	*c.* 6.12.61	Weston, Hitchin (Hertford) 45m. NE.
15669	1stW.	30.9.61	Steep Holme: 51°21′N. 3°07′W. (Somerset) SHT
	×	(23.10.61)	North Newton, Bridgwater (Somerset) 19m. S.
6513	f.g.	21.10.57	Littlestone: 50°59′N. 0°58′E. (Kent) DBO
	×	(26.11.61)	Hove (Sussex) 50m. W.
441350	pull.	5.6.60	*near* Uckfield: 50°58′N. 0°12′E. (Sussex) GRM
	×	(23.1.61)	Barham, Canterbury (Kent) 45m. ENE.
107	1stW.	9.1.60	Eastbourne: 50°46′N. 0°17′E. (Sussex) DDH
	×	27.1.61	Marden (Kent) 30m. NNE.
18699	1stW.	9.9.61	Beachy Head, Eastbourne TRG
	v	28.10.61	Dungeness (Kent) 32m. ENE.
188850	1stW.	16.9.61	Beachy Head TRG
	×	30.11.61	Folkestone (Kent) 45m. ENE.

Long-tailed Tit (*Aegithalos caudatus*) (13; 10 miles; 4$\frac{1}{12}$ years)

09	f.g.	14.10.59	Cranborne: 50°56′N. 1°54′W. (Dorset) RFH
	v	19.1.61	Ewhurst (Surrey) 65m. ENE.

s; is easily the greatest distance a British-ringed Long-tailed Tit has moved.

Wren (*Troglodytes troglodytes*) (19; 15 miles; 2$\frac{9}{12}$ years)

0961–	f.g.	23.9.61	Portland Bill
	v	3.11.61	Wembury, Plymouth (Devon) 72m. W.

Fieldfare (*Turdus pilaris*) (1; 1 year)

65X	1stW. ♀	6.12.60	Little Wilbraham: 52°12′N. 0°12′E. (Cambridge) JHP
	+	16.12.61	Maserada sul Piave: 45°45′N. 12°19′E. (Treviso) **Italy**

Song Thrush (*Turdus philomelos*) (339; 6$\frac{3}{12}$ years)

Table H—Countries and months of recoveries of Song Thrushes

y of recovery	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
lands (2)	1	1	–	–	–	–	–	–	–	–	–	–
n (1)	–	–	–	–	–	–	–	–	1	–	–	–
(9)	3	3	2	–	–	–	–	–	–	1	–	–
7)	–	2	1	(1)	2	–	–	–	–	–	–	–
al (2)	–	–	2	–	–	–	–	–	–	–	–	–

*One record undated
See footnote to Table A

y five of the birds included in Table H were of British origin and these re-*ries* are given in full below. The recovery localities of 12249S, 01826X *S*28723 are further east than we have come to expect for this species.

61	pull.	9.4.61	*near* Pateley Bridge: 54°06′N. 1°46′W. (York) SS&W
	+	22.10.61	Lamarque: 45°06′N. 0°42′W. (Gironde) **France**

77941X	pull.	29.4.61	Skipwith: 53°50′N. 0°59′W. (York) SPS
	/?/	18.12.61	Goncalo: 40°32′N. 7°17′W. (Beira Alta) **Portugal**
S28723	1stW.	16.10.60	Gibraltar Point
	+	21.11.61	Marmolejo: 38°03′N. 4°10′W. (Jaén) **Spain**
01862X	f.g.	10.10.59	Cley
	()	(13.1.61)	La Puerta de Segura: 38°21′N. 2°44′W. (Jaén) **Spain**
12249S	f.g.	15.2.61	Boreham Wood: 51°40′N. 0°16′W. (Hertford) AJW
	+	15.11.61	Pont en Royans: 45°04′N. 5°20′E. (Isère) **France**
R*58899*	pull.	6.5.59	Sittingbourne: 51°20′N. 0°41′E. (Kent) WFAB
	×	1.4.61	Wootton Bassett (Wiltshire) 105m. W.
32876X	pull.	27.4.61	Sherfield: 51°18′N. 1°02′W. (Hampshire) PRM
	/?/	17.12.61	Mondragón: 43°04′N. 2°30′W. (Guipúzcoa) **Spain**
R79163	juv.	25.6.60	Ewhurst: 51°09′N. 0°27′W. (Surrey) W&W
	()	*c.* 18.12.61	*near* Paul: 40°12′N. 7°38′W. (Beira Baixa) **Portugal**
06227X	ad.	6.5.60	Portland Bill
	+	18.10.61	Chadenac: 45°33′N. 0°29′W. (Charente-Maritime) **France**

Redwing (*Turdus iliacus*) (14; 10 miles; 3 $\frac{9}{12}$ years)

CK00170	1stW.	12.10.61	Fair Isle
	()	2.11.61	*near* Sogndal: 58°20′N. 6°17′E. (Rogaland) **Norway**
61171X	1stW.	6.12.60	East Brogan: 57°22′N. 2°00′W. (Aberdeen) AJMS
	/?/	21.5.61	*near* Sysmä: 61°25′N. 25°50′E. (Mikkeli) **Finland**
R*77220*	f.g.	17.12.60	Ponteland: 55°03′N. 1°44′W. (Northumberland) ND&N
	+	25.12.61	Castandet: 43°54′N. 0°30′W. (Landes) **France**
79115X	f.g.	13.1.61	*near* Sedbergh: 54°19′N. 2°32′W. (York) PJM
	+	10.10.61	Sarezzo: 45°39′N. 10°12′E. (Brescia) **Italy**
53718X	f.g.	29.1.61	Huddersfield: 53°39′N. 1°47′W. (York) TDB
	+	(24.10.61)	*near* Bordeaux: *c.* 44°50′N. 0°30′W. (Gironde) **France**
✓16560	f.g.	3.11.57	Spurn Point
	+	24.8.61	Lammassalo: 63°15′N. 26°40′E. (Kuopio) **Finland**
36037X	f.g.	14.2.60	Burton: 53°16′N. 3°02′W. (Cheshire) C&T
	×	12.10.61	Öyfjell: 59°35′N. 8°10′E. (Telemark) **Norway**
735282	f.g.	29.12.60	Sandon: 52°53′N. 2°05′W. (Stafford) C&PM
	×	10.4.61	Belogorye: 50°00′N. 26°25′E. (Ukraine) **U.S.S.R.**
736709	f.g.	5.2.61	Sandon C&PM
	+	*c.* 16.12.61	Vila Verde: 41°39′N. 8°27′W. (Minho) **Portugal**
709223	f.g.	31.12.59	Thorpe: 52°38′N. 1°18′E. (Norfolk) H&W
	+	30.11.61	Guimarães: 41°26′N. 8°19′W. (Minho) **Portugal**
728126	f.g.	14.1.61	Havering: 51°37′N. 0°11′E. (Essex) H&W
	×	27.4.61	Aurland: 60°54′N. 7°12′E. (Sogn-og-Fjordane) **Norway**
38879X	f.g.	12.11.60	Radlett: 51°42′N. 0°19′W. (Hertford) AJW
	+	20.10.61	*near* Bergamo: 45°39′N. 9°48′E. **Italy**
98377X	1stW.	14.1.61	Leigh-on-Sea: 51°33′N. 0°40′E. (Essex) GD
	+	30.11.61	Chokhatauri: 42°00′N. 42°15′E. (Georgia) **U.S.S.R.**

Blackbird (*Turdus merula*) (981; 7-$\frac{4}{12}$ years)

All foreign recoveries are summarised in Table J. Published in full underneath are all recoveries north of 65°N. in Norway and of 60°N. in Sweden, and all recoveries east of 12°E. and south of 46°N. Only 24 movements of more than 50 miles

e recorded within the British Isles, ten of these being between Great Britain Ireland and two between Ireland and Great Britain. The greatest distance ed by a bird ringed as pullus was 72 miles, and, of the 24 movements of over miles, only four were made by birds which could confidently be regarded as of ish origin.

Table J—Countries and months of recoveries of Blackbirds

ry of recovery	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
y (18)	–	8	–	–	–	1	6	1	1	1	–	–
1 (15*)	–	–	1	–	–	1	5	–	2	5	2	–
rk (12)	1	1	(1)	1	–	2	3	1	–	1	1	–
ny (10)	–	–	–	–	(1)	4	–	1	3	1	–	–
(3†)	1	–	–	–	–	1	–	–	–	–	–	1
lands (6)	1	1	–	1	–	1	1	1	–	–	–	–
n (1)	–	–	–	–	1	–	–	–	–	–	–	–
(7)	–	3	4	–	–	–	–	–	–	–	–	–
(1)	–	–	–	1	–	–	–	–	–	–	–	–
(10‡)	(1)	2	3	1	–	1	–	–	–	–	1	–

*Total includes one reported as "summer"
†Total includes one recovered twice (see V89815 below)
‡Total includes one reported as "probably March"
See footnote to Table A

12	f.g. ♀	31.3.58	Isle of May
	v	24.6.59	Hjo: 58°17′N. 14°07′E. (Skaraborg) **Sweden**
	summer 1960		Hjo
	summer 1961		Hjo (last seen *c.* 21.11.61)
X	ad. ♂	17.12.60	West Hartlepool: 54°41′N. 1°13′W. (Durham) PR
	×	26.8.61	Iggesund: 61°39′N. 17°10′E. (Gävleborg) **Sweden**
79	1stW. ♀	14.12.57	Ossett: 53°41′N. 1°35′W. (York) AF
	v	(19.2.60)	Glenties (Donegal) 275m. WNW.
	+	2.8.61	Glenties
55	f.g. ♀	6.10.59	Spurn Point
	v	15.9.61	Dziwnów: 54°02′N. 14°50′E. (Szczecin) **Poland**[1]
	v	9.10.61	Dziwnów
X	1stW. ♂	2.10.61	Spurn Point
	+	17.11.61	St. Hélène: 44°58′N. 0°52′W. (Gironde) **France**
18	1stW. ♀	1.11.59	Gibraltar Point
	×	(14.3.61)	Sianow: 54°15′N. 16°20′E. (Koszalin) **Poland**
53	ad. ♀	16.9.61	Hayes: 51°31′N. 0°25′W. (Middlesex) FKB
	×	23.11.61	Soustons: 43°45′N. 1°19′W. (Landes) **France**
57	ad. ♂	5.11.61	Sandwich Bay
	+	12.11.61	Tourlaville: 49°38′N. 1°34′W. (Manche) **France**
16	f.g. ♀	17.10.58	Dungeness
	+	26.4.61	*near* Laksfors: 65°38′N. 13°16′E. (Nordland) **Norway**
13	f.g.	2.11.59	Dungeness
	× (=♂)	17.4.61	Folkärna: 60°08′N. 16°19′E. (Kopparberg) **Sweden**
X	1stW. ♀	28.9.60	Dungeness
	+	28.1.61	Zumaya: 43°19′N. 2°15′W. (Guipúzcoa) **Spain**

[1]Given *Clarsoria* ring 512704

S was one of a massive arrival of Blackbirds which was noted all down the oast on 5th November 1961.

Wheatear (*Oenanthe oenanthe*) (14; 5 miles; 2 2/12 years)

K81891	pull.	25.6.59	Fair Isle
	×	4.9.61	*near* Julien-en-Born: 44°03′N. 1°14′W. (Landes) **France**
J74447	juv.	21.8.60	Gibraltar Point
	×	4.9.61	*near* St. Julien-en-Born, **France**
618110	juv.	25.7.60	Fair Isle
	()	*c.* 22.2.61	Martos: 37°44′N. 3°58′W. (Jaén) **Spain**
618784	1stS. ♀	21.5.61	Fair Isle
	+	23.9.61	Puerto de Santa Maria: 36°36′N. 6°14′W. (Cádiz) **Spain**
BA03225	juv.	11.8.61	Fair Isle
	+	1.11.61	Sidi-Slimane: 34°38′N. 5°58′W. **Morocco**
BA10105	ad. ♀	29.9.61	Fair Isle
	×	20.10.61	Castets-en-Dorthe: 44°33′N. 0°08′W. (Gironde) **France**
K45196	juv.	20.8.59	Calf of Man: 54°03′N. 4°49′W. CMRS
	v (=♂)	2.4.61	St. Ouen: 49°13′N. 2°13′W. Jersey, **Channel Islands**[1]
H20311	juv.	23.6.61	Skokholm
	()	31.8.61	Bayonne: 43°30′N. 1°28′W. (Basses-Pyrénées) **France**
H20499	1stW.	15.8.61	Skokholm
	×	25.9.61	Sanlúcar: 36°46′N. 6°21′W. (Cádiz) **Spain**
BA03751	pull.	28.5.61	Dungeness
	()	26.8.61	Torredonjimeno: 37°45′N. 3°58′W. (Jaén) **Spain**
H55110	1stW.	7.8.61	Dungeness
	×	18.8.61	Arcachon: 44°40′N. 1°11′W. (Gironde) **France**

[1]Given *Jersey* ring K4658

K81891 and J74447 were killed against a lighted beacon at Contis.

Stonechat (*Saxicola torquata*) (6; 5 miles; 8/12 year)

AC31662	1stW. ♂	11.9.61	Calf of Man: 54°03′N. 4°49′W. GDC
	×	21.12.61	*near* Nantes: 47°13′N. 1°39′W. (Loire-Atlantique) **France**
AB78651	f.g.	16.7.61	Newborough Warren: 53°10′N. 4°22′W. (Anglesey) **C&T**
	v	14.10.61	Portland Bill (Dorset) 195m. SSE.
J35571	1stW. ♂	19.9.61	Cape Clear
	()	1.11.61	Jerez de la Frontera: 36°41′N. 6°08′W. (Cádiz) **Spain**
H39205	1stW. ♀	5.3.61	Dungeness
	/?/	15.11.61	Torrelavega: 43°21′N. 4°03′W. (Santander) **Spain**

Whinchat (*Saxicola rubetra*) (2; 5 miles; 1 year)

H30320	1stW. ♂	12.9.60	Dungeness
	+	24.9.61	Jerez de la Frontera: 36°41′N. 6°08′W. (Cádiz) **Spain**

Redstart (*Phoenicurus phoenicurus*) (4; 5 miles; 4 2/12 years)

AA29075	1stW. ♀	26.8.60	Dungeness
	×	31.5.61	Kesgrave, Ipswich (Suffolk) 80m. N.
C91835	ad. ♀	2.5.57	Portland Bill
	()	(12.7.61)	Castro Marim: 37°13′N. 7°26′W. (Algarve) **Portugal**

Black Redstart (*Phoenicurus ochruros*) (2; 3/12 year)

H38440	f.g.	24.10.60	Dungeness
	()	16.1.61	Higuera: 38°39′N. 5°45′W. (Badajóz) **Spain**
H39350	ad.	5.4.61	Dungeness
	×	*early* 7.61	*near* Sebnitz: 50°59′N. 14°18′E. (Sachsen) **Germany**

Robin (*Erithacus rubecula*) (251; 50 miles; 5 11/12 years)

412	1stW.	4.4.60	Fair Isle
	×	13.3.61	Gorleston-on-Sea (Norfolk) 490m. SSE.
7294	f.g.	13.4.61	Fair Isle
	×	25.11.61	Staithes, Saltburn (York) 340m. S.
6935	f.g.	12.10.61	Fair Isle
	×	16.11.61	Jaulgonne: 49°05′N. 3°32′W. (Aisne) **France**
2006	f.g.	30.3.61	Moniaive: 55°12′N. 3°55′W. (Dumfries) TT
	×	19.11.61	Childwall, Liverpool (Lancashire) 130m. SSE.
11628	f.g.	8.9.61	Calf of Man: 54°03′N. 4°49′W. GDC
	v	5.12.61	Rock, Dungannon (Tyrone) 85m. WNW.
11660	f.g.	11.9.61	Calf of Man GDC
	v	7.12.61	Killasser, Swinford (Mayo) 165m. W.
13666	f.g.	13.10.60	Spurn Point
	*	7.4.61	Den Burg: 53°03′N. 4°47′E. Texel, **Netherlands**
13417	f.g.	18.10.60	Spurn Point
	×	22.10.61	Sint Anna Bosch: 51°32′N. 4°50′E. (Noord-Brabant) **Netherlands**
1141	f.g.	22.10.60	Ingbirchworth: 53°33′N. 1°40′W. (York) JCSE
	×	6.4.61	Hamsterley (Durham) 75m. N.
1211–	f.g.	27.10.60	Gibraltar Point
	v	6.4.61	Amager: 55°38′N. 12°34′E. (Sjaelland) **Denmark**[1]
15082	f.g.	7.10.61	Walberswick: 52°18′N. 1°41′E. (Suffolk) DBC
	()	9.11.61	Montoro: 38°02′N. 4°23′W. (Córdoba) **Spain**
9102	f.g.	21.9.61	Minsmere: 52°14′N. 1°37′E. (Suffolk) HEA
	×	10.10.61	Mondoubleau: 47°59′N. 0°54′E. (Loir-et-Cher) **France**
1771	f.g.	27.2.59	Cambridge: 52°12′N. 0°07′E. SKT
	×	7.4.61	Skendleby, Spilsby (Lincoln) 70m. N.
1115	f.g.	28.8.60	Great Saltee
	×	20.6.61	Mornington, Drogheda (Louth) 110m. NNE.
14478	f.g.	28.8.61	Hayes: 51°32′N. 0°26′W. (Middlesex) FKB
	v	10.9.61	Selsey (Sussex) 60m. S.
1165	f.g.	26.2.61	Barming: 51°16′N. 0°29′E. Maidstone (Kent) MKRG
	×	(24.9.61)	*near* Abbeville: 50°10′N. 1°47′E. (Somme) **France**
18369	juv.	24.6.61	*near* Uckfield: 50°58′N. 0°12′E. (Sussex) GRM
	+	18.9.61	Montoro **Spain**
11055	ad.	21.7.61	*near* Lewes: 50°57′N. 0°02′W. (Sussex) RRL
	×	14.12.61	*near* Tours: 47°24′N. 0°42′E. (Indre-et-Loire) **France**
1177	f.g.	24.3.60	Dungeness
	×	7.4.61	Lamstedt: 53°38′N. 9°05′E. (Niedersachsen) **Germany**
1136	f.g.	4.10.60	Dungeness
	()	(2.2.61)	Moron de la Frontera: 37°07′N. 5°27′W. (Sevilla) **Spain**
1137	f.g.	20.1.58	Eastbourne: 50°46′N. 0°17′E. (Sussex) J&AP
	×	*c.* 1.5.61	Portscatho, St. Mawes (Cornwall) 235m. WSW.

[1]Given *Copenhagen* ring 916589

The ring AA13666 was found in a pellet of a Long-eared Owl (*Asio otus*).

Reed Warbler (*Acrocephalus scirpaceus*) (10; 30 miles; 1 1/12 years)

1205	1stW.	2.8.61	Walberswick: 52°18′N. 1°41′E (Suffolk) DBC
	+	(27.9.61)	Amares: 41°37′N. 8°22′W. (Minho) **Portugal**

H61885	1stW.	14.9.61	Minsmere: 52°14′N. 1°37′E. (Suffolk) HEA
	()	15.10.61	Figueira da Foz: 40°09′N. 8°51′W. (Beira-Litoral) **Portugal**
AC18041	juv.	9.8.61	Slapton Ley: 50°17′N. 3°39′W. (Devon) FRS
	+	(3.10.61)	Estoril: 38°42′N. 9°23′W. (Estremadura) **Portugal**

Blackcap (*Sylvia atricapilla*) (5; 30 miles; 1 4/12 years)

AA13540	f.g. ♀	2.10.60	Spurn Point
	+	*Feb/Mar.* 1961	Facinas: 36°09′N. 5°41′W. (Cádiz) **Spain**
AA92218	f.g. ♀	31.10.60	Gibraltar Point
	×	27.1.61	St. Vincent de Tyrosse: 43°39′N. 1°18′W. (Landes) **France**
AB23896	juv.	23.7.61	Bagpath: 51°39′N. 2°19′W. (Gloucester) KJG
	×	16.8.61	St. Leonard's-on-Sea (Sussex) 135m. ESE.
K36072	f.g. ♀	19.10.59	Guildford: 51°14′N. 0°35′W. (Surrey) NJW
	×	(16.2.61)	Marengo: 36°33′N. 2°20′E. **Algeria**

Garden Warbler (*Sylvia borin*) (3; 5 miles; 11/12 year)

J88614	f.g.	27.8.60	Isle of May
	×	(23.5.61)	Oundle (Northampton) 265m. SSE.
H29917	1stW.	31.8.60	Dungeness
	()	*mid* 8.61	Huétor Tájar: 37°12′N. 4°03′W. (Granada) **Spain**

Whitethroat (*Sylvia communis*) (19; 5 miles; 1 11/12 years)

AC13531	f.g.	19.9.61	Isle of May
	×	(4.10.61)	Chaillevette: 45°44′N. 1°03′W. (Charente-Maritime) **France**
AB96987	ad. ♀	30.7.61	Longannet Point: 56°02′N. 3°42′W. (Fife) JH
	/?/	*c.* 13.10.61	Vagos: 40°33′N. 8°42′W. (Beira-Litoral) **Portugal**
AA13045	f.g. ♀	23.5.60	Spurn Point
	×	14.5.61	Denton (Northampton) 100m. SSW.
J74795	ad. ♂	6.9.60	Gibraltar Point
	×	(15.5.61)	Polmont, Grangemouth (Stirling) 255m. NW.
AA92495	1stW.	28.8.61	Gibraltar Point
	()	4.10.61	Rota: 36°37′N. 6°21′W. (Cádiz) **Spain**
AA24644	ad. ♂	6.5.61	Bradwell
	/?/	10.9.61	Monforte: 42°32′N. 7°30′W. (Lugo) **Spain**
AA95389	juv.	29.7.61	*near* Bristol: 51°30′N. 2°30′W. (Gloucester) RHP
	()	*c.* 12.9.61	Trancoso: 40°46′N. 7°21′W. (Beira-Alta) **Portugal**
AA29923	f.g.	26.6.61	Lydd: 50°57′N. 0°55′E. (Kent) DBO
	+	15.9.61	Ancião: 39°55′N. 8°26′W. (Beira-Litoral) **Portugal**
J26937	ad.	18.8.59	Dungeness
	×	3.6.61	Kennoway, Leven (Fife) 400m. NNW.
J67518	ad. ♂	18.9.59	Dungeness
	×	*c.* 1.6.61	Weston Colville (Cambridge) 90m. NNW.
H55583	1stW.	1.9.61	Dungeness
	/?/	(2.11.61)	Lagos: 37°05′N. 8°40′W. (Algarve) **Portugal**

Willow Warbler (*Phylloscopus trochilus*) (22; 25 miles; 1 5/12 years)

AB12974	f.g.	5.9.61	Isle of May
	+	*c.* 13.10.61	Vagos: 40°33′N. 8°42′W. (Beira-Litoral) **Portugal**

83838	ad.	7.5.60	Ilkley: 53°56′N. 1°49′W. (York) WNS
	+	26.8.61	Covelo: 42°14′N. 8°22′W. (Pontevedra) **Spain**
66687	pull.	27.5.61	Bunny: 52°52′N. 1°07′W. (Notringham) JASB
	()	2.9.61	Monforte: 42°32′N. 7°30′W. (Lugo) **Spain**
2359	f.g.	19.4.60	Bardsey
	/?/	*early* 10.61	*near* Pataias: 39°40′N. 9°00′W. (Estremadura) **Portugal**
8370730	f.g.	16.8.61	Foulness: 51°36′N. 0°55′E. (Essex) PER
	+	27.8.61	Algorta: 43°20′N. 3°00′W. (Vizcaya) **Spain**
7758	juv.	23.8.61	Ruislip: 51°35′N. 0°25′W. (Middlesex) BPP
	+	28.10.61	Chipiona: 36°44′N. 6°26′W. (Cádiz) **Spain**
6662	juv.	3.9.61	Lundy
	×	*c.* 10.10.61	Marinha Grande: 39°45′N. 8°55′W. (Estremadura) **Portugal**
11649	juv.	31.7.60	Dungeness
	×	(2.6.61)	Elworthy, Watchet (Somerset) 185m. W.
A221533	f.g.	21.4.60	*near* Christchurch: 50°43′N. 1°45′W. (Hampshire) CHRS
	v	23.4.61	Bardsey (Caernarvon) 190m. NW.
H199475	f.g.	9.4.61	Portland Bill
	+	29.8.61	Canas de Senhorim: 40°30′N. 7°55′W. (Beira-Alta) **Portugal**

Chiffchaff (*Phylloscopus collybita*) (7; 15 miles; $1\frac{6}{12}$ years)

C02	ad.	13.9.60	Bardsey
	v	28.3.61	Great Saltee (Wexford) 87m. WSW.
7997	f.g.	4.9.61	Bardsey
	×	*c.* 4.10.61	Lisbon: 38°44′N. 9°08′W. **Portugal**
53395	juv.	26.9.59	North Lancing: 50°50′N. 0°20′W. (Sussex) BAEM
	×	(7.4.61)	*near* Maidstone (Kent) 47m. NE.
98810	f.g.	11.9.61	Sandown: 50°39′N. 1°09′W. Isle of Wight LK
	v	20.9.61	Dungeness (Kent) 95m. E.
699391	f.g.	7.4.61	Portland Bill
	×	14.6.61	Exminster (Devon) 45m. W.
38220	ad.	29.8.61	Slapton Ley: 50°17′N. 3°39′W. (Devon) PWCE
	v	5.10.61	Dax: 43°43′N. 1°03′W. (Landes) **France**

Spotted Flycatcher (*Muscicapa striata*) (8; 20 miles; $3\frac{1}{12}$ years)

12563	ad.	24.5.61	Isle of May
	+	(1.10.61)	Berlanga: 38°17′N. 5°50′W. (Badajóz) **Spain**
8433	f.g.	17.5.60	Great Saltee
	v	31.5.61	Oakpark, Tralee (Kerry) 130m. W.
116017	pull.	30.7.61	Nuncham Courtenay: 51°42′N. 1°13′W. (Oxford) OOS
	+	2.10.61	Huétor-Tájar: 37°12′N. 4°03′W. (Granada) **Spain**
411	ad.	19.5.58	Skokholm
	×	(12.7.61)	Glencaly (Wicklow) 95m. NNW.
9551	1stW.	26.8.61	Skokholm
	/?/	(16.10.61)	Bragança: 41°47′N. 6°46′W. (Alto-Douro) **Portugal**
8589	ad.	21.5.60	Reading: 51°27′N. 0°58′W. (Berkshire) DEB
	v	12.5.61	Dungeness (Kent) 90m. ESE.

Pied Flycatcher (*Muscicapa hypoleuca*) (7; 10 miles; $\frac{11}{12}$ year)

65716	pull.	25.6.61	*near* Buxton: 53°18′N. 1°58′W. (Derby) S&W
	+	*c.* 17.9.61	Souzelas: 40°17′N. 8°25′W. (Beira-Litoral) **Portugal**

AC35210	1stW.	4.9.61	Sandwich Bay
	+	23.9.61	Caldas do Gerez: 41°40′N. 8°10′W. (Minho) **Portugal**

Dunnock (*Prunella modularis*) (138; 10 miles; $7\frac{10}{12}$ years)

H37418	f.g.	29.4.61	Fair Isle
	v	18.5.61	Heligoland: 54°11′N. 7°55′E. **Germany**[1]
J74964	f.g.	28.8.61	Gibraltar Point
	×	27.11.61	Colchester (Essex) 87m. SSE.
AC33650	f.g.	12.9.61	Gibraltar Point
	v	22.9.61	Holme, Hunstanton (Norfolk) 13m. SE.
AB44474	juv.	25.5.61	Deeping St. Nicholas: 52°43′N. 0°12′W. (Lincoln) **WAC**
	×	27.8.71	Billingborough, Sleaford (Lincoln) 12m. NNW.
AB26588	f.g.	5.3.61	Great Hallingbury: 51°52′N. 0°11′E. (Essex) RJD
	×	5.1.62	Willingale, Ongar (Essex) 10m. SE.
H69026	juv.	16.9.61	Abberton
	×	9.1.62	Burnham-on-Crouch (Essex) 13m. S.
AB62613	ad.	15.7.61	Hoddesdon: 51°47′N. 0°00′ (Hertford) TWG
	×	2.2.62	Leytonstone (Essex) 14m. S.
AA31608	juv.	25.8.61	Bradwell
	×	(2.4.62)	Newdigate, Dorking (Surrey) 65m. SW.

[1]Given *Helgoland* ring 9943883

Meadow Pipit (*Anthus pratensis*) (43; 100 miles; $4\frac{5}{12}$ years)

89311	juv.	27.6.60	Fair Isle
	+	1.1.61	Aljustrel: 37°52′N. 8°10′W. (Baixo-Alentejo) **Portugal**
89218	1stW.	23.8.60	Fair Isle
	×	*c.* 1.1.61	Beja: 38°01′N. 7°52′W. (Baixo-Alentejo) **Portugal**
H47126	juv.	20.8.61	Fair Isle
	+	*c.* 8.11.61	Albergaria-dos-Doze: 39°48′N. 8°35′W. (Beira-Litoral) **Portugal**
AB12536	ad.	10.5.61	Isle of May
	+	21.11.61	Sanlúcar: 36°46′N. 6°21′W. (Cádiz) **Spain**
AB70074	f.g.	9.9.61	Copeland
	×	20.10.61	Avilés: 43°33′N. 5°55′W. (Oviedo) **Spain**
AA22002	pull.	14.5.61	Sandscale: 54°09′N. 3°14′W. (Lancashire) KB
	+	6.10.61	Soustons: 43°45′N. 1°19′W. (Landes) **France**
J45347	f.g.	30.8.59	Calf of Man: 54°03′N. 4°49′W. CMRS
	×	*c.* 6.3.61	Santa Justa: 38°45′N. 7°52′W. (Alto-Alentejo) **Portugal**
J30647	pull.	7.6.60	Harrogate: 53°59′N. 1°33′W. (York) CTW
	()	10.1.61	Faro: 37°01′N. 7°56′W. (Algarve) **Portugal**
J98845	ad.	7.5.60	Ilkley: 53°56′N. 1°49′W. (York) WNS
	+	6.1.61	Algorta: 43°20′N. 3°00′W. (Vizcaya) **Spain**
ABo5895	f.g.	12.9.61	Spurn Point
	×	*c.* 4.11.61	Queijas: 38°43′N. 9°10′W. (Estremadura) **Portugal**
H33198	f.g.	2.9.60	Benacre: 52°21′N. 1°43′E. (Suffolk) H&W
	×	*c.* 9.2.61	Serpa: 37°56′N. 7°36′W. (Baixo-Alentejo) **Portugal**
H23171	1stW.	11.8.60	Minsmere: 52°14′N. 1°37′E. (Suffolk) HEA
	×	2.2.61	Ibahernando: 39°20′N. 5°55′W. (Cáceres) **Spain**
H61822	1stW.	29.8.61	Minsmere HEA
	()	28.10.61	Fuerte del Rey: 37°53′N. 3°53′W. (Jaén) **Spain**

187209	f.g.	26.9.60	Great Saltee
	+	13.10.60	Durango: 43°10′N. 2°38′W. (Vizcaya) **Spain**
9031	f.g.	30.8.61	Great Saltee
	×	(10.12.61)	Croix de Vic: 46°42′N. 1°56′W. (Vendée) **France**
9289	f.g.	8.9.61	Great Saltee
	+	22.10.61	Durango, **Spain**
9388	f.g.	18.9.61	Great Saltee
	+	22.10.61	St. Jean de Luz: 43°23′N. 1°39′W. (Basses-Pyrénées) **France**
0009	f.g.	20.9.61	Great Saltee
	/?/	6.11.61	Alza: 43°18′N. 1°55′W. (Guipúzcoa) **Spain**
72325	pull.	4.5.61	Otmoor: 51°50′N. 1°12′W. Beckley (Oxford) OOS
	+	0.12.61	Valverde de Llerena: 38°13′N. 5°49′W. (Badajóz) **Spain**
9186	f.g.	17.9.61	Bradwell
	×	15.12.61	Alvalade: 37°56′N. 8°24′W. (Baixo-Alentejo) **Portugal**
14633	pull.	5.5.61	East Tilbury: 51°28′N. 0°26′E. (Essex) ABO
	/?/	(7.11.61)	Feria: 38°30′N. 6°35′W. (Badajóz) **Spain**
0424	f.g.	8.9.60	*near* Christchurch: 50°43′N. 1°45′W. (Hampshire) **CHRS**
	v	13.10.61	Anglet: 43°29′N. 1°30′W. (Basses-Pyrénées) **France**
84458	f.g.	11.9.60	Portland Bill
	()	15.10.61	Sanlucar, **Spain**

Pied/White Wagtail (*Motacilla alba*) (87; 40 miles; 6 $\frac{6}{12}$ years)

110	ad. ♂	18.8.58	Eigg: 56°54′N. 6°09′W. Inner Hebrides PRE
	v	25.12.61	St. Nicolas-de-Redon: 47°39′N. 2°03′W. (Loire-Atlantique) **France**
794	f.g.	28.4.61	Isle of May
	×	24.11.61	Salvaterra: 39°01′N. 8°47′W. (Ribatejo) **Portugal**
	ad.	30.4.58	Bamburgh: 55°36′N. 1°43′W. (Northumberland) **MHBO**
	×	15.10.61	Leftwich, Northwich (Cheshire) 160m. SSW.
6747	juv.	8.9.60	Ossett: 53°41′N. 1°35′W. (York) AF
	()	2.1.61	Matozinhos: 41°11′N. 8°42′W. (Douro-Litoral) **Portugal**
061	1stW. ♂	1.3.61	Cambridge: 52°12′N. 0°07′E. CMR
	×	4.6.61	Wishaw (Lanark) 290m. NW.
253	juv.	31.7.61	Hoddesdon: 51°47′N. 0°00′ (Hertford) RJD
	/?/	26.11.61	Las Cabezas de San Juan: 36°59′N. 5°56′W. (Sevilla) **Spain**
266	ad. ♂	7.10.60	Wolvercote: 51°46′N. 1°15′W. (Oxford) OOS
	×	13.3.61	Heligoland: 54°11′N. 7°55′E. **Germany**

Yellow Wagtail ssp. (*Motacilla flava*) (8; 20 miles; 2 $\frac{10}{12}$ years)

413	juv.	20.7.61	Hartshill: 52°37′N. 1°32′W. (Warwick) MJD
	×	(14.9.61)	Enborne, Newbury (Berkshire) 75m. S.

Red-backed Shrike (*Lanius cristatus collurio*) (1; $\frac{1}{12}$ year)

X	juv.	24.7.61	Middleton: 52°44′N. 0°26′E. (Norfolk) M&B
	v	1.9.61	Benacre (Suffolk) 55m. ESE.

Starling (*Sturnus vulgaris*) (1,027; 9 $\frac{10}{12}$ years)

X	1stW. ♂	11.1.61	Hexham: 54°58′N. 2°06′W. (Northumberland) C&L
	×	16.7.61	Skogn: 63°42′N. 11°12′E. Levanger (Nord-Tröndelag) **Norway**

R55653	f.g.	10.1.59	Runcorn: 53°21′N. 2°44′W. (Cheshire) C&T
	+	8.11.61	Cap Gris Nez: 50°52′N. 1°35′E. (Pas-de-Calais) **France**
S77225	juv.	6.7.57	Dungeness
	/?/	8.6.61	Grevesmühlen: 53°53′N. 11°11′E. (Mecklenburg) **Germany**
V79336	f.g.	18.4.58	Dungeness
	()	19.4.61	Uglich: 57°31′N. 38°20′E. (Yaroslav) **U.S.S.R.**

Published in full above are the extreme recoveries from north, east and south, and a foreign recovery of a bird of probable British origin. These and all other foreign recoveries are summarised in Table K.

Table K—Countries and months of recoveries of Starlings

Country of recovery	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
France (2)	–	–	–	–	–	–	–	–	1	–	1	–
Belgium (3)	–	–	–	–	–	–	(1)	1	–	–	1	–
Netherlands (23)	4	1	5	2	–	2	–	–	5	–	1	5
Denmark (15)	2	1	2	1	5	–	1	1	1	–	1	–
Norway (10)	2	4	1	2	1	–	–	–	–	–	–	–
Sweden (10*)	1	2	–	3	–	–	–	–	–	–	–	1
Germany (31)	6	5	2	7	6	2	1	1	1	–	–	–
Poland (4)	1	1	(1)	–	–	–	–	–	1	–	–	–
Finland (1)	–	1	–	–	–	–	–	–	–	–	–	–
Baltic States (7†)	1	1	1	–	1	1	1	–	–	–	–	–
U.S.S.R. (20‡)	1	7	2	2	3	1	2	–	1	–	–	–

*Total includes three undated records
†Total includes one reported as "spring"
‡Total includes one reported as "January-July"
See footnote to Table A

The months of ringing of birds of presumed Continental origin were: October, 11; November, 15; December, 20; January, 37; February, 27; March, 12; and April, 3; extreme dates being 10th October and 18th April.

Of 23 recoveries showing movement of more than 100 miles within the British Isles, only seven involved birds of presumed British origin.

Greenfinch (*Chloris chloris*) (295; 100 miles; 7$\frac{2}{12}$ years)

54645X	juv.	16.10.60	Ilkley: 53°56′N. 1°49′W. (York) WNS
	×	(2.8.61)	Shilbottle, Alnwick (Northumberland) 100m. N.
S60113	f.g. ♀	6.4.58	Spurn Point
	v	6.2.61	Gosforth (Northumberland) 115m. NW.
V83615	f.g. ♂	29.3.60	Colwyn Bay: 53°18′N. 3°43′W. (Denbigh) AEM
	×A	(19.4.61)	Sunningdale, Ascot (Berkshire) 180m. SE.
R39319	f.g. ♂	13.12.59	*near* Sandbach: 53°08′N. 2°22′W. (Cheshire) AWG
	×	16.7.61	*near* St. Neots (Huntingdon) 100m. SE.
04279S	1stW. ♂	4.3.61	Havering: 51°37′N. 0°11′E. (Essex) JEF
	×	24.12.61	Coryton, Tavistock (Devon) 190m. WSW.
615826	juv.	10.9.60	East Tilbury: 51°28′N. 0°26′E. (Essex) H&W
	+	3.12.61	Chartres: 48°27′N. 1°30′E. (Eure-et-Loir) **France**
79211X	ad. ♀	15.4.61	Steep Holme: 51°21′N. 3°07′W. (Somerset) SHT
	×	(28.4.61)	*near* Ulverston (Lancashire) 195m. N.
14017X	1stW. ♀	7.11.59	Dungeness
	×	10.6.61	Salisbury (Wiltshire) 120m. W.

Goldfinch (*Carduelis carduelis*) (37; 100 miles; 3$\frac{6}{12}$ years)

AC21350	juv.	2.9.61	Brancaster: 52°58′N. 0°38′E. (Norfolk) WAC
	/?/	28.10.61	Lier: 51°07′N. 4°34′E. (Antwerpen) **Belgium**

5051	juv.	12.8.61	*near* Sutton Bridge: 52°44′N. 0°11′E. (Lincoln) M&B
	/?/	4.10.61	Moorslede: 50°53′N. 3°04′E. (West Flanders) **Belgium**
3340	juv.	21.8.61	Walberswick: 52°18′N. 1°41′E. (Suffolk) DBC
	()	1.10.61	Zwevegem: 50°48′N. 3°20′E. (West Flanders) **Belgium**
9379	juv.	20.8.61	*near* Woodbridge: 52°04′N. 1°29′E. (Suffolk) BE
	v	26.10.61	Lezennes: 50°39′N. 3°05′E. (Nord) **France**
6695	f.g.	21.4.59	Clacton-on-Sea: 51°48′N. 1°09′E. (Essex) GF
	()	5.11.61	Aranzaza: 43°08′N. 2°47′W. (Vizcaya) **Spain**
44406	1stW.	9.9.61	Hoddesdon: 51°47′N. 0°00′ (Hertford) RJD
	×	12.11.61	Cavignac: 45°06′N. 0°23′W. (Gironde) **France**
65843	pull.	1.7.61	Foulness: 51°36′N. 0°55′E. (Essex) GD
	+	(15.11.61)	Covarrubias: 42°04′N. 3°31′W. (Burgos) **Spain**
6526	ad.	6.8.60	Cliffe: 51°28′N. 0°30′E. (Kent) NKRG
	v	30.12.61	Massognes: 46°45′N. 0°07′E. (Vienne) **France**
7790	juv.	23.7.61	Swanscombe: 51°28′N. 0°18′E. (Kent) NKRG
	/?/	15.10.61	Ploegsteert: 50°44′N. 2°54′E. (West Flanders) **Belgium**
00259	juv.	29.6.61	Northfleet: 51°27′N. 0°20′E. (Kent) REI
	/?/	14.10.61	Pecq: 50°41′N. 3°19′E. (Hainaut) **Belgium**
43096	juv.	23.8.61	Addington: 51°22′N. 0°02′W. (Surrey) DS
	()	1.12.61	Villamanta: 40°18′N. 4°06′W. (Madrid) **Spain**
51826	ad. ♀	22.5.61	Pensford: 51°22′N. 2°33′W. (Somerset) DMC
	×	25.12.61	Castillon: 44°51′N. 0°02′W. (Gironde) **France**
1:109	ad. ♂	19.2.61	*near* Godalming: 51°12′N. 0°34′W. (Surrey) W&W
	+	28.12.61	Ondárroa: 43°19′N. 2°28′W. (Vizcaya) **Spain**
4339	ad. ♀	14.8.60	Idmiston: 51°08′N. 1°44′W. (Wiltshire) GHF
	×	*c.* 25.10.61	Facture: 44°39′N. 0°58′W. (Gironde) **France**
1:3	1stW.	2.10.60	Littlestone: 50°59′N. 0°58′E. (Kent) DBO
	×	20.3.61	Sains-en-Amiénois: 49°50′N. 2°20′E. (Somme) **France**
416	juv.	5.9.59	Totton: 50°56′N. 1°29′W. (Hampshire) RNE
	+	2.2.60	Pamplona: 42°49′N. 1°39′W. (Navarra) **Spain**
5339	f.g.	4.10.56	Dungeness
	()	0.10.59	Bersillies-L'Abbaye: 50°16′N. 4°09′E. (Hainaut) **Belgium**
1442	1stW.	12.5.58	Dungeness
	+	6.11.61	Pamplona, **Spain**
2008	1stW.	2.10.60	Dungeness
	v	21.4.61	Armentières: 50°41′N. 2°53′E. (Nord) **France**
	v	19.5.61	Wulvergem: 50°45′N. 2°52′E. (West Flanders) **Belgium**
1737	juv.	2.9.60	Cranborne: 50°55′N. 1°56′W. (Dorset) RFH
	()	7.4.61	Lejona: 43°23′N. 2°57′W. (Vizcaya) **Spain**
51779	juv.	25.8.60	Chale Green: 50°37′N. 1°19′W. Isle of Wight CTW
	v	4.11.61	Vieux-Boucau-les-Bains: 43°47′N. 1°24′W. (Landes) **France**

Siskin (*Carduelis spinus*) (2; 1 year)

5985	f.g. ♀	18.9.60	*near* Seahouses: 55°35′N. 1°39′W. (Northumberland) MHBO
	v	12.10.61	Halen: 50°57′N. 5°07′E. (Limburg) **Belgium**
51744	ad. ♂	15.1.61	Colchester: 51°53′N. 0°53′E. (Essex) M&S
	v	5.10.61	Goeferdinge: 50°46′N. 3°50′E. (East Flanders) **Belgium**

Linnet (*Carduelis cannabina*) (68; 220 miles; $3\frac{2}{12}$ years)

AB54816	pull.	12.5.61	Holywell: 55°04′N. 1°27′W. (Northumberland) JDP
	()	(13.10.61)	Bordeaux: 44°50′N. 0°34′W. (Gironde) **France**
640441	f.g. ♀	21.9.61	Knaresborough: 54°01′N. 1°28′W. (York) JRM
	+	16.10.61	St. Martin de Seignanx: 43°33′N. 1°22′W. (Landes) **France**
AA76745	juv.	8.9.60	Ossett: 53°41′N. 1°35′W. (York) AF
	()	27.10.61	Blanquefort: 44°55′N. 0°37′W. (Gironde) **France**
AB70641	pull.	14.7.61	Ossett AF
	+	30.10.61	Le Haillan: 44°53′N. 0°41′W. (Gironde) **France**
J22021	ad. ♀	1.9.61	Ossett AF
	/?/	27.12.61	Lorignac: 45°27′N. 0°42′W. (Charente-Maritime) **France**
J22078	ad. ♀	20.9.61	Ossett AF
	()	26.10.61	*near* Arveyres: 44°55′N. 0°14′W. (Gironde) **France**
AB98749	f.g.	18.7.61	Sprotborough: 53°32′N. 1°09′W. (York) RJR
	+	(25.10.61)	Tarifa: 36°01′N. 5°36′W. (Cádiz) **Spain**
AC17973	juv.	9.8.61	Sprotborough RJR
	()	16.11.61	Soustons: 43°45′N. 1°19′W. (Landes) **France**
AC07417	juv.	30.7.61	Hartshill: 52°37′N. 1°32′W. (Warwick) MJD
	×	16.12.61	Thenac: 45°40′N. 0°39′W. (Charente-Maritime) **France**
H36141	pull.	10.5.61	Nuneaton: 52°32′N. 1°28′W. (Warwick) HL
	+	22.10.61	Torremolinos: 36°38′N. 4°30′W. (Málaga) **Spain**
H36156	pull.	15.5.61	Nuneaton HL
	()	10.10.61	La Teste: 44°34′N. 1°09′W. (Gironde) **France**
H14068	pull.	6.6.60	Benacre: 52°21′N. 1°43′E. (Suffolk) H&W
	+	*c.* 2.1.61	Granja de Torrehermosa: 38°19′N. 5°35′W. (Badajóz) **Spain**
AA93254	juv.	12.8.61	Walberswick: 52°18′N. 1°41′E. (Suffolk) DBC
	+	29.10.61	Eysines: 44°54′N. 0°40′W. (Gironde) **France**
E41236	pull.	13.7.58	Oakington: 52°16′N. 0°04′E. (Cambridge) CBC
	()	*c.* 2.10.61	Cantanhede: 40°20′N. 8°36′W. (Beira-Litoral) **Portugal**
AB76954	ad. ♀	12.7.61	Culham: 51°39′N. 1°17′W. (Oxford) GJL
	+	26.10.61	Soustons, **France**
J51142	ad. ♀	10.4.60	Foulness: 51°36′N. 0°55′E. (Essex) GD
	+	29.10.61	Blaye: 45°08′N. 0°40′W. (Gironde) **France**
AB82063	ad. ♀	21.9.61	Leigh-on-Sea: 51°33′N. 0°40′E. (Essex) GD
	()	26.10.61	St. Caprais: 44°50′N. 0°34′W. (Gironde) **France**
73654	juv.	29.8.59	Cliffe: 51°28′N. 0°30′E. (Kent) NKRG
	v	14.10.60	Temse: 51°08′N. 4°13′E. (East Flanders) **Belgium**
H3193–	f.g.	10.9.60	Cliffe NKRG
	+	0.1.61	Soustons, **France**
H40965	ad. ♀	24.6.61	Cliffe NKRG
	()	4.11.61	Otura: 37°05′N. 3°38′W. (Granada) **Spain**
H63831	juv. ♀	2.9.61	Cliffe NKRG
	+	3.11.61	Valdetorres: 40°42′N. 3°30′W. (Madrid) **Spain**
AB39349	1stW. ♂	9.4.61	Sittingbourne: 51°20′N. 0°41′E. (Kent) MKRG
	+	13.10.61	Margaux: 45°03′N. 0°40′W. (Gironde) **France**
AB53421	pull.	12.5.61	Porton: 51°08′N. 1°44′W. (Wiltshire) GHF
	()	12.10.61	Tresses: 44°50′N. 0°32′W. (Gironde) **France**
H11542	juv.	17.7.60	Dungeness
	()	0.10.61	Casteljaloux: 44°19′N. 0°06′E. (Lot-et-Garonne) **France**

0037	1stW.	4.9.60	Dungeness
	+	30.10.61	Macau: 45°01′N. 0°36′W. (Gironde) **France**
9496	juv.	10.6.61	Dungeness
	+	*c.* 14.10.61	(Gironde) **France**
2109	ad. ♀	21.9.61	Dungeness
	×	2.12.61	Tours: 47°23′N. 0°42′E. (Indre-et-Loire) **France**
199018	f.g. ♂	12.10.60	Portland Bill
	+	20.11.61	Anglet: 43°29′N. 1°30′W. (Basses-Pyrénées) **France**

Twite (*Carduelis flavirostris*) (1; 7 days)

55184	f.g.	15.10.61	Walberswick: 52°18′N. 1°41′E. (Suffolk) DBC
	v	22.10.61	Foulness (Essex) 57m. SSW.

Redpoll (*Carduelis flammea*) (15; 5 miles; 2 $\frac{3}{12}$ years)

62707	juv.	29.7.61	Fenwick: 55°39′N. 1°54′W. Beal (Northumberland) **ND&N**
	/?/	28.10.61	Bommershoven: 50°47′N. 5°25′E. (Limburg) **Belgium**
62723	ad. ♀	12.8.61	Fenwick ND&N
	v	10.10.61	Halen: 50°57′N. 5°07′E. (Limburg) **Belgium**
723	1stW. ♀	29.8.60	Craster: 55°28′N. 1°35′W. (Northumberland) MHBO
	()	*c.* 10.11.61	Izegem: 50°55′N. 3°13′E. (West Flanders) **Belgium**
217	juv. ♀	21.8.61	Craster MHBO
	/?/	10.10.61	Jumet: 50°26′N. 4°26′E. (Hainaut) **Belgium**
042	ad. ♂	15.7.59	Calf of Man: 54°03′N. 4°49′W. CMRS
	/?/	29.10.61	Lommel: 51°13′N. 5°18′E. (Limburg) **Belgium**
091	ad.	23.9.61	*near* Wakefield: 53°39′N. 1°30′W. (York) AF
	v	15.10.61	Armentières: 50°41′N. 2°53′E. (Nord) **France**
15617	ad. ♂	24.9.61	Ailsworth: 52°35′N. 0°19′W. (Northampton) RVC
	×	7.10.61	Halle: 50°44′N. 4°14′E. (Brabant) **Belgium**
5628	1stW. ♂	24.9.61	Ailsworth RVC
	()	8.10.61	Dailly-lez-Couvin: 50°03′N. 4°26′E. (Namur) **Belgium**
5659	ad. ♂	24.9.61	Ailsworth RVC
	v	15.10.61	*near* Recht: 50°19′N. 6°03′E. (Liège) **Belgium**
5721	1stW. ♂	24.9.61	Ailsworth RVC
	/?/	5.10.61	Barchon: 50°40′N. 5°42′E. (Liège) **Belgium**
154	1stW. ♂	2.10.61	Ailsworth RVC
	/?/	15.10.61	Omal: 50°39′N. 5°12′E. (Liège) **Belgium**
6665	f.g. ♂	16.10.61	Walberswick: 52°18′N. 1°41′E. (Suffolk) DBC
	v	29.10.61	Berloz: 50°42′N. 5°13′E. (Liège) **Belgium**
643	f.g. ♀	25.2.61	*near* Haslemere: 51°05′N. 0°42′W. (Surrey) PGD
	v	29.10.61	Geest-Gérompont: 50°37′N. 4°47′E. (Brabant) **Belgium**
0	1stW. ♂	5.10.59	Dungeness
	/?/	16.10.61	Herentals: 51°11′N. 4°50′E. (Antwerpen) **Belgium**

Bullfinch (*Pyrrhula pyrrhula*) (116; 10 miles; 4 $\frac{1}{12}$ years)

57722	ad. ♀	7.6.61	Peakirk: 52°38′N. 0°17′W. (Northampton) NH
	×	(6.8.62)	Pode Hole, Spalding (Lincoln) 10m. NNE.
35	ad. ♂	2.10.61	Ailsworth: 52°35′N. 0°19′W. (Northampton) RVC
	+	16.3.62	Ash, Sevenoaks (Kent) 85m. SSW.
3X	f.g. ♀	26.4.61	St. Ives: 52°20′N. 0°05′W. (Huntingdon) GFR
	()	27.10.61	Overijse: 50°46′N. 4°32′E. (Brabant) **Belgium**

AB17519	ad. ♀	5.2.61	Burwell: 52°16′N. 0°20′E. (Cambridge) DAP
	+	15.2.62	Meldreth (Cambridge) 17m. SW.
AB54665	ad. ♂	6.5.61	West Wycombe: 51°39′N. 0°48′W. (Buckingham) DNM
	×	(9.1.62)	Stoughton, Chichester (Sussex) 50m. S.
AA82347	f.g. ♂	12.2.61	Basildon: 51°36′N. 0°28′E. (Essex) VSW
	+	25.2.62	Ilford (Essex) 16m. W.
87332X	1stW. ♀	8.11.60	Sittingbourne: 51°20′N. 0°41′E. (Kent) WFAB
	v	22.11.61	*near* Versailles: 48°44′N. 2°04′E. (Seine-et-Oise) **France**
71900X	ad. ♀	29.10.61	Sandwich Bay
	()	19.4.62	Flitcham, Castle Rising (Norfolk) 110m. NNW.
AB21396	ad. ♀	20.5.61	Ewhurst: 51°09′N. 0°26′W. (Surrey) W&W
	×	3.1.62	Angmering, Worthing (Sussex) 23m. S.
AC04766	f.g. ♀	20.12.61	*near* Hythe: 51°06′N. 1°04′E. (Kent) HS
	×	3.5.62	Cranfield (Bedford) 95m. NW.

22023X and 87332X are the first foreign recoveries of British-ringed Bullfinches.

Chaffinch (*Fringilla coelebs*) (104; 40 miles; $6\frac{5}{12}$ years)

K37472	f.g. ♂	8.4.58	Spurn Point
	()	24.7.61	Namsos: 64°28′N. 11°30′E. (Nord-Tröndelag) **Norway**
J20313	f.g. ♀	7.10.59	Spurn Point
	v	6.11.61	Kennemerduinen: 52°25′N. 4°33′E. (Noord-Holland) **Netherlands**[1]
J87400	1stW. ♂	2.4.60	Spurn Point
	v	12.3.61	Millwood, Barrow-in-Furness (Lancashire) 135m. WNW.
J86229	f.g. ♀	7.4.60	Spurn Point
	×	19.3.61	Abbey, Darwen (Lancashire) 105m. W.
AA03105	ad. ♂	14.2.60	Capel Curig: 53°06′N. 3°54′W. (Caernarvon) RAFK
	×	23.6.61	Joutseno: 61°07′N. 28°40′E. (Kymi) **Finland**
73384	ad. ♀	14.3.60	Costock: 52°51′N. 1°09′W. (Nottingham) JASB
	v	19.2.61	*near* Essen: 51°26′N. 7°03′E. (Nordrhein-Westfalen) **Germany**[2]
J10741	ad. ♂	6.3.60	Clacton-on-Sea: 51°48′N. 1°09′E. (Essex) GF
	×	9.4.61	Flöysvik: 58°54′N. 5°55′E. Höle (Rogaland) **Norway**
AA80859	1stW. ♀	11.12.60	Havering: 51°37′N. 0°11′E. (Essex) JEF
	×	17.5.61	Hirvelä: 60°31′N. 23°28′E. (Turku-ja-Pori) **Finland**
AB41454	ad. ♂	11.3.61	Havering JEF
	/?/	30.10.61	Turnhout: 51°19′N. 4°57′E. (Antwerpen) **Belgium**
AB20560	ad. ♀	15.1.61	*near* Portishead: 51°29′N. 2°45′W. (Somerset) RFT
	×	16.4.61	Vuorenmaa: 61°08′N. 22°23′E. (Turku-ja-Pori) **Finland**
E89388	ad. ♀	15.1.61	Saltford: 51°24′N. 2°28′W. (Somerset) MAW
	×	19.9.61	*near* Plön: 54°10′N. 10°26′E. (Schleswig-Holstein) **Germany**
K70118	f.g. ♀	30.10.58	Lundy
	v	15.10.61	Kohlscheid: 50°50′N. 6°05′E. (Nordrhein-Westfalen) **Germany**
AB10504	ad. ♀	31.12.60	Fordingbridge: 50°56′N. 1°48′W. (Hampshire) JSA
	()	*summer* 1961	Norra Stavsudda: 59°24′N. 18°53′E. (Stockholm) **Sweden**
AB10553	ad. ♂	31.12.60	Fordingbridge JSA
	v	23.3.61	Harryda: 57°42′N. 12°20′E. (Göteborg-och-Bohus) **Sweden**
	v	2.4.61	Harryda

[1]Given *Leiden* ring R6762
[2]Given *Helgoland* ring 80096581

Brambling (*Fringilla montifringilla*) (3; 1 5/12 years)

1141	ad. ♂	11.10.59	Spurn Point
	v	26.3.61	Brasschaat: 51°17′N. 4°30′E. (Antwerpen) **Belgium**
7715	1stW. ♂	11.10.59	Spurn Point
	v	19.3.61	*near* High Wycombe (Buckingham) 140m. SSW.
417	ad. ♂	31.1.60	Elm Park: 51°33′N. 0°12′E. Romford (Essex) RRS
	v	10.11.61	Maasdyk: 51°58′N. 4°13′E. (Zuid-Holland) **Netherlands**

Reed Bunting (*Emberiza schoeniclus*) (31; 10 miles; 5 2/12 years)

11633	1stW. ♀	22.8.61	Seaton Burn: 55°02′N. 1°36′W. (Northumberland) C&L
	/?/	(18.12.61)	Cliburn, Penrith (Cumberland) 50m. WSW.
4200	f.g. ♂	4.1.60	Bradwell
	×	28.10.61	Oostende: 51°13′N. 2°55′E. (West Flanders) **Belgium**
3125	ad. ♂	31.10.59	Ingatestone: 51°41′N. 0°23′E. (Essex) MAO
	v	2.10.61	Benacre (Suffolk) 75m. NW.
6	1stW. ♂	13.12.59	Elm Park: 51°35′N. 0°11′E. Romford (Essex) RRS
	v	19.3.60	Dungeness (Kent) 53m. SE.
	v	24.2.61	Dungeness
	v	4.3.61	Dungeness
991	juv.	5.8.59	Coate: 51°34′N. 1°47′W. Swindon (Wiltshire) GLW
	/?/	6.8.61	Mudeford, Christchurch (Hampshire) 55m. S.

4200 is only the second British-ringed Reed Bunting to be recovered abroad.

Snow Bunting (*Plectrophenax nivalis*) (2; 5 miles; 23 days)

1185	1stW. ♀	29.10.61	Foulness: 51°36′N. 0°55′E. (Essex) GD
	v	21.11.61	Knokke: 51°21′N. 3°19′E. (West Flanders) **Belgium**

House Sparrow (*Passer domesticus*) (311; 30 miles; 8 10/12 years)

20	f.g. ♀	17.1.60	Spurn Point
	+	(14.11.61)	*near* Market Weighton (York) 38m. NW.
1837	f.g. ♀	3.4.61	Spurn Point
	()	*c.* 5.6.61	Lebberston, Scarborough (York) 46m. NNW.
6543	juv. ♀	24.8.61	Maidstone: 51°17′N. 0°31′E. (Kent) MKRG
	v	(14.10.61)	Hoads Hill, Fareham (Hampshire) 76m. SW.

Tree Sparrow (*Passer montanus*) (34; 30 miles; 2 10/12 years)

	f.g.	5.3.61	Parkhead: 53°23′N. 1°29′W. Sheffield (York) E&E
	×	(30.10.61)	Hatton, Wragby (Lincoln) 50m. E.
	f.g.	23.1.60	Sutton Park: 52°34′N. 1°50′W. (Warwick) NH
	×A	13.7.61	Kibworth (Leicester) 35m. E.
5	juv.	25.8.61	Benacre: 52°21′N. 1°43′E. (Suffolk) H&W
	v	18.10.61	Dungeness (Kent) 105m. SSW.
83	f.g.	16.11.60	Westleton: 52°16′N. 1°36′E. (Suffolk) HEA
	v	2.5.61	Spurn Point (York) 110m. NW.
	ad.	24.6.61	Cliffe: 51°28′N. 0°30′E. (Kent) NKRG
	v	26.11.61	Merstham, Redhill (Surrey) 30m. WSW.
	juv.	16.7.61	Dungeness
	×	(27.10.61)	Folkington, Polegate (Sussex) 32m. W.

KEY TO RINGERS' INITIALS IN LIST OF RECOVERIES

DRA	D. R. Anderson
HEA	H. E. Axell
JSA	J. S. Ash
JWA	J. W. Allen
CGB	C. G. Booth
CJB	C. J. Booth
DEB	D. E. Bradley
EB	E. Balfour
EJMB	E. J. M. Buxton
FKB	F. K. Bennett
GRB	G. R. Bennett
JAB	J. A. Benington
JASB	J. A. S. Borrett
JFWB	J. F. W. Bruhn
KB	K. Brown
PAB	P. A. Banks
TBB	T. B. Bagenal
TDB	T. D. Bisiker
TLB	T. L. Bartlett
WFAB	W. F. A. Buck
CBC	Cambridge Bird Club
DBC	Dingle Bird Club
DFC	Dublin Field Club
DMC	Miss D. M. Crampton
FBC	F. B. Clemson
JCC	J. C. Coulson
MOC	Midlothian Orn. Club
PRC	P. R. Catchpole
RVC	R. V. Collier
WC	Winchester College
WAC	W. A. Cook
GD	G. Downey
HMD	H. M. Dobinson
MJD	M. J. Drakeley
PGD	P. G. Davis
RJD	R. J. Dowsett
BE	B. Ebert
JCSE	the late J. C. S. Ellis
MCWE	M. C. W. Evans
PRE	P. R. Evans
PWCE	P. W. C. Ellicott
RNE	R. N. Elmes
TE	T. Ennis
WJE	W. J. Eggeling
AF	A. Frudd
GF	G. Felstead
GHF	G. H. Forster
JEF	J. E. Flynn
MAFF	Ministry of Agriculture, Fisheries and Food
WUF	Miss W. U. Flower
AWG	A. W. Goodin
BEG	Brathay Exploration Group
CG	J. C. Green
EAG	Miss E. A. Garden
JG	J. Grierson
JCG	J. C. Gittins
KJG	K. J. Grearson
MEG	M. E. Griffiths
MKRG	Mid-Kent Ringing Group
NKRG	North Kent Ringing Group
SWG	Sheppy Wader Group
TRG	Tolworth Ringing Group
TWG	T. W. Gladwin
WWRG	Wash Wader Ringing Group
DDH	D. D. Harber
DFH	D. F. Harle
JH	J. Hoy
NH	N. Henson
RAOH	R. A. O. Hickling
RFH	R. F. Hemsley
REI	R. E. Ingram
ARJ	A. R. Johnson
EEJ	E. E. Jackson
LK	Miss L. Kennedy
RAFK	R. A. F. Kemp
GJL	G. J. Langsbury
HL	H. Lapworth
JL	the late Rev. J. Lees
RFL	Miss R. F. Levy
RRL	R. R. Lovegrove
AEM	A. E. Male
ATM	A. T. Macmillan
BAEM	B. A. E. Marr
DNM	D. N. Makepeace
GRM	G. R. Mountfort
JRM	J. R. Mather
PM	P. Meredith
PJM	P. J. Mawby
PRM	P. R. Marshall
JN	J. Noonan
JFN	J. F. Naylor
ABO	A. B. Old
BBO	Bardsey Bird Observatory
CO	Clifford Oakes
DBO	Dungeness Bird Observatory
FIBO	Fair Isle Bird Observatory
MAO	M. A. Ogilvie
MHBO	Monks' House Bird Observatory
SABO	St. Agnes Bird Observatory
SBO	Skokholm Bird Observatory
SBBO	Sandwich Bay Bird Observatory
ACP	A. C. Parker
BPP	B. P. Pickess
DAP	D. A. Palmer
IJP	I. J. Patterson
IVBP	I. V. Balfour Paul
JDP	J. D. Parrack
JHP	J. H. Phillips
RHP	R. H. Poulding
CMR	C. M. Reynolds
GFR	G. F. Rivers
PR	P. Reid
PER	P. Rudge
RJR	R. J. Rhodes
AJMS	A. J. M. Smith

AVS	A. V. Smith
CHRS	Christchurch Harbour Ringing Station
CMRS	Calf of Man Ringing Station
DS	D. Shepherd
FRS	F. R. Smith
HS	H. Schreiber
LNHS	London Natural History Society
OOS	Oxford Ornithological Society
RRS	Romford Ringing Station
RTS	R. T. Smith
RWJS	R. W. J. Smith
SNHS	Sorby Natural History Society
SPS	St. Peter's School
WNS	Wharfedale Naturalists' Society
BJT	B. J. Tompkinson
NT	N. Tinbergen
RFT	R. F. Thearle
SHT	Steep Holme Trust
SKT	Miss S. K. Taylor
TT	T. Todd
AU	Aberdeen University
ABW	A. B. Watson
AJW	A. J. Waller
CW	C. Winn
CTW	C. Worrin
DRW	D. R. Wilson
GLW	G. L. Webber
JW	J. Wagstaff
MW	Mrs. M. Waller
MAW	M. A. Wright
NJW	N. J. Westwood
VSW	V. S. Wiseman
C&L	Clissold & Little
C&T	Cockbain & Thomason
C&PM	C. & P. Minton
E&E	Evans & Edwards
F&L	Fenton & Leach
F&M	Flegg & Musson
H&W	Hurrell & Waite
J&AP	J. & A. Platt
J&JH	J. & J. Harrison
M&B	Mead & Boddy
M&S	Mann & Syer
ND&N	Northumberland, Durham & Newcastle N.H.S.
S&W	Sorensen & Wilks
SS&W	Sanderson, Summersgill & Walker
W&W	Weller & Weller

OBSERVATORIES

Ringers' initials and co-ordinates are omitted where the ringing was carried out at one of the following observatories:

Bardsey	52°46′N. 4°48′W.	Isle of May	56°11′N. 2°33′W.
Bradwell	51°44′N. 0°54′E.	Portland	50°31′N. 2°27′W.
Cape Clear	51°26′N. 9°30′W.	St. Agnes	49°53′N. 6°21′W.
Cley	52°58′N. 1°03′E.	Saltee	52°07′N. 6°35′W.
Copeland	54°40′N. 5°32′W.	Sandwich Bay	51°17′N. 1°20′E.
Dungeness	50°55′N. 0°59′E.	Skokholm	51°42′N. 5°16′W.
Fair Isle	59°32′N. 1°37′W.	Slimbridge	51°44′N. 2°25′W.
Gibraltar Point	53°06′N. 0°21′E.	Spurn	53°35′N. 0°06′E.
Lundy	51°12′N. 4°40′W.	Tory	55°16′N. 8°14′W.

Also at Abberton Reservoir: 51°50′N. 0°53′E. (Major-General C. B. Wainwright); and on the Farne Islands: 55°37′N. 1°37′W. (Northumberland, Durham and Newcastle N.H.S.).

Occasionally, co-ordinates of ringing localities are omitted on grounds of security.

Recoveries in Great Britain and Ireland of birds ringed abroad

By E. P. Leach

Selected list of recoveries reported

The symbols and terms are the same as those used in the "Report on bird-ringing" (see page 503), with the exception that the term "juv." cannot always be relied upon to signify a young bird that is able to fly freely: owing to lack of unanimity in the various ringing schemes, this term may sometimes mean a nestling or chick.

Abbreviations used for ringing stations

B.	Brussels	*R.*	Radolfzell (ex-Rossitten)
C.	Copenhagen	*Rk.*	Reykjavik
G.	Gothenburg	*San S.*	San Sebastian (Grupo Aranzadi)
H.	Heligoland	*Skov.*	Skovgaard, Viborg, Denmark
Hki.	Helsinki	*Stav.*	Stavanger
J.B.O.	Jersey Bird Observatory	*St.*	Stockholm
L.	Leiden	*St. Orn.*	Stockholm "Ornis" (Sveriges Ornithologiska Förening)
M.	Moscow		
O.	Oslo	*S.J.F.*	Svenska Jägare Förbundet
P.	Paris	*U.S.A.*	Fish & Wildlife Service, Washington D.C.
Pe.	Prague		

Heron (*Ardea cinerea*)

O.	pull.	10.6.57	Egersund: 58°28′N. 6°00′E. (Rogaland) **Norway**
060373	×	24.5.58	Hexham: 54°58′N. 2°06′W. (Northumberland)

Bittern (*Botaurus stellaris*)

B.	pull.	16.5.60	Zonhoven: 50°59′N. 5°22′E. (Limburg) **Belgium**
K8859	×	12.1.61	Norton: 51°55′N. 2°12′W. (Gloucester)

Mallard (*Anas platyrhynchos*)

Hki.	ad. ♀	4.6.57	Kempele: 64°58′N. 25°27′E. **Finland**
H18274	+	11.12.60	Doncaster: 53°30′N. 1°07′W. (York)
Hki.	juv.	25.7.57	Oulujoki: 64°58′N. 25°27′E. **Finland**
H23741	+	23.11.60	Croxton: 52°50′N. 2°20′W. (Stafford)
Hki.	juv.	10.7.59	Kristinestad: 62°17′N. 21°20′E. **Finland**
H33093	+	0.12.59	Welney: 52°31′N. 0°15′E. (Norfolk)
Hki.	ad. ♂	16.5.58	Tyrväntö: 61°10′N. 24°19′E. **Finland**
D13964	×	2.1.60	Brenchley: 51°09′N. 0°23′E. (Kent)
S.J.F.	ad. ♂	8.4.58	Östersund: 63°11′N. 14°37′E. (Jämtland) **Sweden**
060549	+	12.1.59	Old Meldrum: 57°20′N. 2°19′W. (Aberdeen)
S.J.F.	ad.	12.5.58	Bista: 59°16′N. 15°09′E. (Närke) **Sweden**
104438	+	24.12.60	West Lothian
S.J.F.	juv. *transp.*	15.6.59	Östermalma: 58°57′N. 17°09′E. (Södermanland) **Sweden** Väsby: 59°31′N. 17°54′E. (Uppland)
102050	+	15.1.60	Middle Drove: 52°39′N. 0°17′E. (Norfolk)
S.J.F.	juv. *transp.*	29.5.59	Bista, **Sweden** Flosjöhyttan: 59°34′N. 14°35′E. (Västmanland)
103650	×	4.6.60	Scotforth: 54°02′N. 2°48′W. (Lancashire)

JF.	ad.	29.7.60	Bista, **Sweden**
	transp.		Östansjö: 59°01′N. 15°01′E. (Närke)
7714	+	17.12.60	Freuchie: 56°14′N. 3°09′W. (Fife)
JF.	juv.	0.7.59	Blombacka: 58°21′N. 13°20′E. (Västergötland) **Sweden**
	transp.		Gammalstorp: 58°25′N. 12°47′E. (Västergötland)
1103	+	4.12.59	Ancroft: 55°42′N. 2°00′W. (Northumberland)

650 was killed on her nest in Lancashire by a hay-cutting machine. Some the birds transported from one place to another may have been hand-reared.

Teal (*Anas crecca*)

..	juv.	10.7.56	Oulujoki: 64°58′N. 25°27′E. **Finland**
5514	+	1.8.57	Overton Marsh: 54°00′N. 2°51′W. (Lancashire)
..	juv.	8.8.59	Gamlakarleby: 63°50′N. 23°08′E. **Finland**
000	+	14.11.59	St. Johnstown: 54°56′N. 7°28′W. (Donegal)
..	juv.	27.7.60	Gamlakarleby: 63°50′N. 23°08′E. **Finland**
179	+	21.1.61	Bembridge: 50°40′N. 1°25′W. Isle of Wight, Hampshire
..	juv.	17.6.59	Töysä: 62°36′N. 23°44′E. **Finland**
9951	+	16.1.60	Killaloe: 52°50′N. 8°28′W. (Clare)
	juv.	29.6.59	Pori: 61°30′N. 21°45′E. **Finland**
5588	+	*c.* 20.10.59	Ferns: 52°35′N. 6°31′W. (Wexford)
	pull.	5.8.57	Hornafjordur: 64°18′N. 15°11′W. **Iceland**
12	+	18.10.61	Holbeach Marsh: 52°52′N. 0°05′E. (Lincoln)
	pull.	16.6.61	Zandvoort: 52°22′N. 4°31′E. (Noord Holland) **Netherlands**
4477	+	9.12.61	Brittas: 53°14′N. 6°27′W. (Dublin)
	1stW. ♂	17.1.57	Le Sambuc: 43°31′N. 4°42′E. (Bouches-du-Rhône) **France**
6593	+	2.2.61	Clonmellon: 53°40′N. 7°01′W. (Meath)
	1stW. ♀	30.1.58	Le Sambuc, **France**
8810	+	19.1.61	Ardfry: 53°14′N. 9°01′W. (Galway)
	1stW. ♂	9.1.59	Le Sambuc, **France**
0069	+	26.2.61	Kilkishen: 52°49′N. 8°45′W. (Clare)
	1stW. ♂	17.10.59	Le Sambuc, **France**
0005	v	28.1.61	Abberton: 51°50′N. 0°53′E. (Essex)
	1stW. ♂	25.11.59	Le Sambuc, **France**
8377	+	30.1.61	Whauphill: 54°49′N. 4°29′W. (Wigtown)
	1stW. ♀	7.3.60	Le Sambuc, **France**
8361	+	0.12.60	Brancaster: 52°58′N. 0°41′E. (Norfolk)

Wigeon (*Anas penelope*)

	juv.	25.7.60	Gamlakarleby: 63°50′N. 23°08′E. **Finland**
44	×	*c.* 5.11.60	Burton: 53°15′N. 3°02′W. (Cheshire)
	juv.	27.6.59	Töysä: 62°36′N. 23°44′E. **Finland**
658	+	22.9.59	Kelty: 56°09′N. 3°20′W. (Fife)
	♀	5.2.60	Meetkerke: 51°14′N. 3°09′E. (West Flanders) **Belgium**
776	+	17.1.61	River Lune: *c.* 54°03′N. 2°50′W. (Lancashire)

Pintail (*Anas acuta*)

	1stW. ♂	26.9.61	Texel: 53°06′N. 4°48′E. **Netherlands**
224	+	Nov./Dec. 61	South Suffolk
	♂	13.11.60	Naardermeer: 52°18′N. 5°08′E. (Noord Holland) **Netherlands**
883	+	Nov./Dec. 61	South Suffolk
	♂	13.2.58	Haarsteeg: 51°43′N. 5°13′E. (Noord Brabant) **Netherlands**
83	+	0.1.61	Beckley: 50°59′N. 0°38′E. (Sussex)

L.	f.g.	31.12.60	Haarsteeg, **Netherlands**
5007552	+	Sept./Nov. 61	South Suffolk
L.	♂	31.10.60	Brabantse Biesbosch: *c.* 51°45′N. 4°48′E. **Netherlands**
5001332	+	18.12.61	R. Blackwater estuary (Essex)

Shoveler (*Spatula clypeata*)

M.	ad. ♀	30.5.61	Lake Kaniera: 57°00′N. 23°38′E. **Latvian S.S.R.**
C97221	+	4.9.61	Oakmere: 53°13′N. 2°39′W. (Cheshire)
L.	1stW. ♂	23.7.60	Brabantse Biesbosch: *c.* 51°45′N. 4°48′E. **Netherlands**
4001398	+	5.10.61	Randalstown: 54°45′N. 6°19′W. (Antrim)
L.	1stW. ♂	8.9.60	Brabantse Biesbosch, **Netherlands**
4001437	+	2.12.61	Westbere: 51°19′N. 1°10′E. (Kent)

Tufted Duck (*Aythya fuligula*)

Rk.	ad. ♀	26.6.57	Myvatn: 65°39′N. 16°58′W. **Iceland**
43284	+	31.1.61	R. Blackwater: 54°27′N. 6°40′W. Lough Neagh (Tyrone)

Scaup (*Aythya marila*)

Rk.	ad. ♀	24.6.56	Skipalón: 65°47′N. 18°12′W. **Iceland**
37302	×	2.1.61	Carlingford Lough: 54°03′N. 6°10′W. (Down)

Pochard (*Aythya ferina*)

Pe.	ad. ♀	1.8.61	Breclav: 48°46′N. 16°53′E. **Czechoslovakia**
C27685	+	11.11.61	Feltham: 51°28′N. 0°25′W. (Middlesex)
L.	♀	29.1.57	Lekkerkerk: 51°55′N. 4°43′E. (Zuid Holland) **Netherlands**
372327	+	0.10.60	Kilmallock: 52°24′N. 8°34′W. (Limerick)

Goldeneye (*Bucephala clangula*)

S.J.F.	♀	13.6.58	Täxan-Stamsele: 63°43′N. 15°49′E. (Jämtland) **Sweden**
060447	+	11.11.60	Druridge Bay: 55°19′N. 1°33′W. (Northumberland)
S.J.F.	♀	24.6.60	Frösön: 63°10′N. 14°32′E. (Jämtland) **Sweden**
73344	+	4.12.61	Loch Leven: *c.* 56°12′N. 3°25′W. (Kinross)

Shelduck (*Tadorna tadorna*)

H.	ad.	5.8.58	Trischen: 54°03′N. 8°40′E. (Holstein) **Germany**
397203	×	28.12.61	Cliffe: 51°28′N. 0°29′E. (Kent)
H.	ad.	5.8.60	Trischen, **Germany**
397320	+	14.1.61	Long Sutton: 51°02′N. 2°46′W. (Somerset)
H.	ad.	31.8.58	R. Weser estuary: *c.* 53°50′N. 8°20′E. **Germany**
366922	×	28.1.61	Breydon Water: *c.* 52°37′N. 1°42′E. (Norfolk)
H.	ad.	14.8.60	R. Weser estuary, **Germany**
3008008	×	29.12.61	Lytham: 53°44′N. 2°58′W. (Lancashire)
H.	ad.	28.8.60	R. Weser estuary, **Germany**
3008152	×	13.6.61	Lochgilphead: 56°02′N. 5°27′W. (Argyll)
H.	ad.	28.8.60	R. Weser estuary, **Germany**
3008187	+	18.2.61	Penclawdd: 51°38′N. 4°06′W. (Glamorgan)

These birds were all ringed in the moulting area on the German sand-banks.

White-fronted Goose (*Anser albifrons*)

C.	ad.	13.7.58	Jakobshavn District: 70°06′N. 52°08′W. **Greenland**
271348	+	2.12.60	Dundalk: 54°01′N. 6°24′W. (Louth)
C.	juv.	20.7.59	Jakobshavn District, **Greenland**
273113	+	23.1.60	North Slob: 52°20′N. 6°28′W. (Wexford)

C.	juv.	1.8.58	Jakobshavn District, **Greenland**
281698	v	14.3.59	Slimbridge: 51°44′N. 2°25′W. (Gloucester)
C.	juv.	16.7.48	Jakobshavn District, **Greenland**
272188	+	22.2.60	South Slob (Wexford)
C.	juv.	19.7.50	Jakobshavn District, **Greenland**
272727	+	11.2.61	North Slob (Wexford)
C.	juv.	19.7.59	Jakobshavn District, **Greenland**
272729	+	12.12.59	Killag Slob (Wexford)
C.	juv.	9.7.59	Jakobshavn District, **Greenland**
272820	+	24.1.60	Birr: 53°06′N. 7°54′W. (Offaly)
C.	ad.	29.7.55	Jakobshavn District, **Greenland**
273362	+	*winter* 59/60	Wexford
C.	juv.	29.7.55	Jakobshavn District, **Greenland**
273412	+	11.2.61	North Slob (Wexford)
C.	ad.	4.8.49	Jakobshavn District, **Greenland**
274022	+	20.12.58	North Slob (Wexford)
C.	juv.	4.8.54	Upernavik District: 72°25′N. 55°30′W. **Greenland**
270754	+	22.2.59	Letterkenny: 54°57′N. 7°45′W. (Donegal)
C.	juv.	4.7.55	Christianshaab: 68°50′N. 51°00′W. **Greenland**
271971	+	26.1.59	Killorglin: 52°07′N. 9°47′W. (Kerry)
C.	juv.	9.7.60	Christianshaab District: 68°30′N. 51°50′W. **Greenland**
279955	+	19.12.60	North Slob (Wexford)
L.	1stW. ♂	22.1.60	Bunschoten: 52°14′N. 5°22′E. (Utrecht) **Netherlands**
8000534	+	5.2.61	Minsterworth: 51°51′N. 2°20′W. (Gloucester)

Pink-footed Goose (*Anser arvensis brachyrhynchus*)

The Pink-footed Geese ringed in Iceland in 1951 and 1953 are still providing many recoveries in Great Britain, but all are from areas well known to be favoured by this species and it is evident that the winter-quarters remain the same each year.

Barnacle Goose (*Branta leucopsis*)

C.	ad. ♂	31.7.55	Flemingfjorden: 71°30′N. 23°20′W. **Greenland**
275426	v	*winter* 58/59	Ardara: 54°46′N. 8°24′W. (Donegal)
C.	ad. ♂	6.8.55	Flemingdalen: 71°30′N. 23°20′W. **Greenland**
274895	×	0.4.59	Isle of Islay: 55°45′N. 6°15′W. (Argyll)
C.		6.8.55	Flemingdalen, **Greenland**
274991	+	11.1.59	Clare Island: 53°48′N. 10°00′W. (Mayo)
C.	juv.	6.8.55	Flemingdalen, **Greenland**
275289	+	22.1.60	Bowmore, Isle of Islay (Argyll)
C.	ad. ♂	7.8.55	Flemingdalen, **Greenland**
275480	+	26.10.59	Eochar: 57°23′N. 7°25′W. South Uist

Flemingfjorden and Flemingdalen are neighbouring localities.

Kestrel (*Falco tinnunculus*)

Hki.	pull.	9.7.59	Björköby: 63°25′N. 21°10′E. Valsörarna, **Finland**
C82997	+	30.10.59	Rugby: 52°22′N. 1°15′W. (Warwick)
G.	pull.	23.6.59	Rölanda: 58°51′N. 11°54′E. (Dalsland) **Sweden**
C57297	×	18.6.60	*near* Rotherham: 53°26′N. 1°21′W. (York)

Coot (*Fulica atra*)

J.B.O.	ad.	25.12.55	St. Ouen: 49°13′N. 2°13′W. Jersey, **Channel Islands**
E625	+	10.1.59	Hickling Broad: 52°45′N. 1°35′E. (Norfolk)

Oystercatcher (*Haematopus ostralegus*)

Stav.	pull.	26.6.59	Runde: 62°25′N. 5°38′E. (Sunnmöre) **Norway**
523912	×	30.4.60	R. Dee estuary: 53°23′N. 3°15′W. (Cheshire)

Lapwing (*Vanellus vanellus*)

Hki.	pull.	14.6.56	Pori: 61°30′N. 21°45′E. **Finland**
C53841	+	*c.* 10.1.60	Bagenalstown: 52°42′N. 6°57′W. (Carlow)
Stav.	pull.	21.5.56	Volda: 62°09′N. 6°04′E. (Möre og Romsdal) **Norway**
631491	×	10.1.61	*near* Hornsea: 53°54′N. 0°10′W. (York)
Stav.	pull.	10.5.57	*near* Stavanger: 58°58′N. 5°46′E. **Norway**
622463	+	9.2.59	St. John's: 49°15′N. 2°08′W. Jersey, **Channel Islands**
Stav.	pull.	13.5.56	Time: 58°43′N. 5°38′E. (Rogaland) **Norway**
613447	×	2.1.60	*near* Ripon: 54°08′N. 1°31′W. (York)
Stav.	pull.	18.5.55	Oppstad: 58°39′N. 5°41′E. (Rogaland) **Norway**
615206	+	31.12.61	Carlingford: 54°02′N. 6°12′W. (Louth)
Skov.	pull.	31.5.59	Fjerritslev: 57°04′N. 9°17′E. (Jutland) **Denmark**
S28051	×	3.3.61	*near* Selby: 53°47′N. 1°04′W. (York)
H.	pull.	22.5.60	Elmshorn: 53°46′N. 9°41′E. (Holstein) **Germany**
6026879	×	24.4.61	Snargate: 51°01′N. 0°51′E. (Kent)

Ringed Plover (*Charadrius hiaticula*)

H.	pull.	25.5.58	Sylt: 54°50′N. 8°18′E. North Frisian Islands, **Germany**
7307529	×	8.1.61	Lancaster: 54°04′N. 2°48′W.

Golden Plover (*Charadrius apricarius*)

Rk.	pull.	11.7.56	Fnjóskadalur: 65°46′N. 17°53′W. **Iceland**
75720	+	(21.9.61)	Glenville: 52°03′N. 8°26′W. (Cork)
Rk.	f.g.	15.9.58	Midnes: 64°04′N. 22°43′W. **Iceland**
611405	+	21.10.61	Clonfert: 53°14′N. 8°03′W. (Galway)
Rk.	f.g.	13.10.59	Midnes, **Iceland**
612097	+	0.12.61	Glenamaddy: 53°37′N. 8°34′W. (Galway)
Rk.	ad.	6.6.61	Midnes, **Iceland**
612295	×	27.12.61	Dingle: 52°08′N. 10°16′W. (Kerry)
L.	f.g.	27.3.59	Onderdendam: 53°20′N. 6°35′E. (Groningen) **Netherlands**
2000254	v	4.11.61	Harty: 51°22′N. 0°55′E. Sheppey (Kent)

Turnstone (*Arenaria interpres*)

Rk.	ad.	25.5.60	Midnes: 64°04′N. 22°43′W. **Iceland**
711083	v	10.5.61	St. Agnes: 49°53′N. 6°21′W. Scilly (Cornwall)

Snipe (*Gallinago gallinago*)

Hki.	ad.	27.7.59	Gamlakarleby: 63°50′N. 23°08′E. **Finland**
A96782	+	17.11.59	Haverfordwest: 51°48′N. 4°59′W. (Pembroke)
Stav.	pull.	15.5.56	Varhaug: 58°37′N. 5°41′E. (Rogaland) **Norway**
755104	+	0.12.60	North Uist, Outer Hebrides
H.	f.g.	19.8.61	Münster: 51°57′N. 7°38′E. (Westfalen) **Germany**
7373989	×	*c.* 22.10.61	High Ongar: 51°43′N. 0°16′E. (Essex)

Woodcock (*Scolopax rusticola*)

Hki.	pull.	29.5.59	Kangasala: 61°33′N. 24°13′E. **Finland**
C79175	+	19.11.59	Knockmore: 54°01′N. 9°11′W. (Mayo)

Curlew (*Numenius arquata*)

Hki.	pull.	12.6.60	Oulujoki: 64°58′N. 25°27′E. **Finland**
C71448	+	30.1.61	Monaghan: 54°18′N. 6°59′W.
Hki.	pull.	3.6.59	Töysä: 62 36′N. 23°44′E. **Finland**
C77928	+	25.10.59	Chichester: 50°50′N. 0°50′W. (Sussex)
Hki.	pull.	8.6.61	Töysä, **Finland**
C116511	+	29.10.61	Cockerham, Lancashire
Hki.	pull.	4.6.59	Tjöck: 62°19′N. 21°35′E. **Finland**
C76179	×	0.1.60	Morston: 52°56′N. 1°00′E. (Norfolk)
Hki.	pull.	7.6.59	Tjöck: 62°19′N. 21°31′E. **Finland**
C73006	+	1.9.59	*near* Grimsby: 53°35′N. 0°04′W. (Lincoln)
Hki.	pull.	14.6.57	Pori: 61°30′N. 21°45′E. **Finland**
C57624	+	6.9.61	Hightown: 53°32′N. 3°04′W. (Lancashire)
Hki.	pull.	24.6.57	Vehkalahti: 60°37′N. 27°08′E. **Finland**
H23347	+	24.11.57	Cockerham: 53°59′N. 2°50′W. (Lancashire)
O.	pull.	8.7.58	Tranöy: 68°09′N. 15°45′E. (Troms) **Norway**
045955	×	20.9.58	Peterhead: 57°31′N. 1°47′W. (Aberdeen)
H.	pull.	22.5.61	Saerbeck: 52°11′N. 7°39′E. (Westfalen) **Germany**
435448	+	16.9.61	Llanrhidian: 51°36′N. 4°09′W. (Glamorgan)

Common Sandpiper (*Tringa hypoleucos*)

Hki.	pull.	17.6.59	Vällskog: 60°19′N. 24°38′E. **Finland**
B31501	×	9.6.60	Exmouth: 50°37′N. 3°25′W. (Devon)

This is the first foreign-ringed Common Sandpiper to be recovered in Britain.

Knot (*Calidris canutus*)

U.S.A.	pull.	9.7.55	Eureka: 80°00′N. 85°40′W. Ellesmere Island, **Canada**
50275260	v	22.8.61	St. Kilda: 57°49′N. 8°34′W. Outer Hebrides
Rk.	ad.	25.5.60	Midnes: 64°04′N. 22°43′W. **Iceland**
711067	+	10.12.61	Rosslare Strand: 52°21′N. 6°24′W. (Wexford)
Stav.	f.g.	20.8.55	Revtangen: 58°45′N. 5°30′E. (Rogaland) **Norway**
605497	×	5.3.61	Teesmouth: *c.* 54°38′N. 1°10′W. (Durham)

Dunlin (*Calidris alpina*)

Hki.	ad.	22.5.60	Björköby: 63°25′N. 21°10′E. Valsörårna, **Finland**
P38189	v	29.8.61	Dawsmere: 52°52′N. 0°08′E. (Lincoln)
St.	ad.	28.7.60	Ledskär: 60°30′N. 17°38′E. Lövsta Bay, **Sweden**
3003057	v	13.1.61	Dawlish Warren: 50°37′N. 3°27′W. (Devon)
St. Orn.	1stW.	21.9.57	Ottenby: 56°13′N. 16°25′E. Öland, **Sweden**
211237	+	12.1.61	Baswick Steer: 53°55′N. 0°23′W. (York)
St. Orn.	ad.	27.7.58	Ottenby, **Sweden**
242674	+	12.1.61	Baswick Steer (York)
St. Orn.	ad.	6.8.58	Ottenby, **Sweden**
212534	v	4.3.61	Harty: 51°22′N. 0°55′E. Sheppey (Kent)

St. Orn.	1stW.	2.9.59	Ottenby, **Sweden**
214753	v	29.8.61	Dawsmere (Lincoln)
St.	ad.	6.7.61	Ottenby, **Sweden**
3019014	v	25.8.61	Terrington Marsh: 52°48′N. 0°18′E. (Norfolk)
St.	ad.	27.7.61	Ottenby, **Sweden**
3044063	×	18.12.61	Levington: 52°00′N. 1°16′E. (Suffolk)
St.	ad.	17.8.61	Ottenby, **Sweden**
3052881	v	8.11.61	Attenborough: 52°54′N. 1°14′W. (Nottingham)
St.	ad.	20.8.61	Ottenby, **Sweden**
3055142	v	4.11.61	Harty, Sheppey (Kent)
Stav.	ad. ♂	27.8.59	Revtangen: 58°45′N. 5°30′E. (Rogaland) **Norway**
857432	v	29.8.61	Dawsmere (Lincoln)
Stav.	f.g.	27.8.59	Revtangen, **Norway**
851763	v	9.9.61	Allhallows: 51°28′N. 0°39′E. (Kent)
Stav.	f.g.	15.9.60	Revtangen, **Norway**
849126	×	19.11.60	Sutton: 53°23′N. 6°08′W. (Dublin)
Stav.	f.g.	16.9.60	Revtangen, **Norway**
849246	v	20.9.60	Beadnell: 55°33′N. 1°37′W. (Northumberland)
C.	1stW.	5.10.53	Amager: 55°40′N. 12°38′E. **Denmark**
887804	×	27.1.54	Guernsey: 49°27′N. 2°36′W. (Channel Islands)
C.	ad.	29.7.57	Amager, **Denmark**
845882	+	24.12.61	Fota Island: 51°54′N. 8°19′W. (Cork Harbour)
C.	ad.	25.7.58	Amager, **Denmark**
822377	v	4.11.61	Harty, Sheppey (Kent)

Arctic Skua (*Stercorarius parasiticus*)

C.	pull.	12.7.61	Strömö: 62°09′N. 7°11′W. **Faeroes**
560108	×	2.9.61	Cleator Moor: 54°32′N. 3°31′W. (Cumberland)

Great Black-backed Gull (*Larus marinus*)

M.	pull.	7.6.60	Great Ainov Islands: 69°50′N. 31°35′E. **U.S.S.R.**
C94685	×	4.11.61	Walton Reservoir: 51°24′N. 0°23′W. (Surrey)
M.	pull.	9.6.60	Great Ainov Islands, **U.S.S.R.**
C94772	×	22.11.61	Kendal: 54°20′N. 2°45′W. (Westmorland)
M.	pull.	15.6.60	Great Ainov Islands, **U.S.S.R.**
C94983	×	5.3.61	Walton Reservoir (Surrey)
M.	pull.	15.6.60	Great Ainov Islands, **U.S.S.R.**
C94997	×	21.2.61	Fair Isle: 59°32′N. 1°37′W. (Shetland)
M.	pull.	16.6.60	Great Ainov Islands, **U.S.S.R.**
C94802	×	10.12.61	Benfleet: 51°33′N. 0°34′E. (Essex)
M.	pull.	11.7.60	Great Ainov Islands, **U.S.S.R.**
D488966	×	24.1.61	*near* Peterborough: 52°34′N. 0°14′W. (Northampton)
M.	pull.	14.7.60	Great Ainov Islands, **U.S.S.R.**
D488290	×	29.1.61	West Molesey: 51°24′N. 0°21′W. (Surrey)
M.	pull.	19.6.60	Murmansk coast: 68°49′N. 37°20′E. **U.S.S.R.**
D492259	×	1.2.61	Brora: 58°01′N. 3°51′W. (Sutherland)
Stav.	pull.	4.7.55	Hovden: 61°40′N. 4°51′E. (Sogn og Fjordane) **Norway**
034684	×	20.3.60	*near* Norwich: 52°38′N. 1°20′E. (Norfolk)

Stav.	pull.	7.6.59	Klepp: 58°44′N. 5°33′E. (Rogaland) **Norway**
417174	×	5.3.61	Thornham: 52°58′N. 0°36′E. (Norfolk)
Stav.	pull.	24.6.59	Rott: 58°55′N. 5°30′E. (Rogaland) **Norway**
416796	×	1.1.60	Caistor: 52°39′N. 1°46′E. (Norfolk)
Stav.	pull.	26.6.59	Kvitsöy: 59°04′N. 5°29′E. (Rogaland) **Norway**
310605	×	(21.1.60)	Falmouth: 50°08′N. 5°04′W. (Cornwall)
Stav.	pull.	12.7.61	Bremanger: 61°46′N. 4°53′E. (Sogn og Fjordane) **Norway**
410923	+	8.10.61	Cleethorpes: 53°34′N. 0°02′W. (Lincoln)

Lesser Black-backed Gull (*Larus fuscus*)

P.	pull.	7.6.60	Molène Archipelago: 48°24′N. 4°58′W. (Finistère) **France**
DE2362	×	28.8.61	Falmouth: 50°08′N. 5°04′W. (Cornwall)

Herring Gull (*Larus argentatus*)

M.	pull.	27.6.60	Great Ainov Islands: 69°50′N. 31°35′E. **U.S.S.R.**
D487376	×	5.2.61	Withernsea: 53°44′N.0°02′E. (York)
M.	pull.	1.7.60	Great Ainov Islands, **U.S.S.R.**
D487861	×	0.1.61	Teesmouth: *c.* 54°38′N. 1°10′W. (York)
M.	pull.	0.6.60	Murmansk coast: 68°49′N. 37°20′E. **U.S.S.R.**
D492577	v	13.12.61	Fair Isle: 59°32′N. 1°37′W. (Shetland)

Common Gull (*Larus canus*)

Common Gulls have been recovered in considerable numbers in Britain since the last report. The countries of origin were, as usual, Finland, Scandinavia, the Baltic Republics and the northern coast of Germany.

Little Gull (*Larus minutus*)

M.	pull.	20.6.61	Lake Engure: 57°10′N. 23°13′E. **Latvian S.S.R.**
P78021	×	31.12.61	Waldershare: 51°11′N. 1°18′E. Dover (Kent)

Black-headed Gull (*Larus ridibundus*)

Recoveries of Black-headed Gulls in Britain in winter are always numerous and the rings originate in many different countries. These are Finland, the Baltic Republics, Scandinavia, the Netherlands, Belgium and northern Germany, as well as the breeding-colonies situated far inland in Czechoslovakia, southern Poland, Bavaria and Saxony.

Kittiwake (*Rissa tridactyla*)

M.	juv.	22.7.57	Murmansk coast: 68°49′N. 37°20′E. **U.S.S.R.**
E460112	/?/	22.2.59	Atlantic Ocean: 52°45′N. 12°00′W.
M.	pull.	3.7.60	Murmansk coast, **U.S.S.R.**
E611598	×	(19.3.61)	Pwllheli: 52°54′N. 4°26′W. (Caernarvon)
Stav.	pull.	16.7.59	Runde: 62°25′N. 5°38′E. (Sunnmöre) **Norway**
629398	()	7.3.60	Inverness: 57°29′N. 4°13′W.

Stav.	pull.	18.7.59	Runde, **Norway**
631235	×	15.5.60	Collieston: 57°21′N. 1°56′W. (Aberdeen)
Stav.	pull.	11.7.60	Runde, **Norway**
645582	×	10.7.61	Blundellsands: 53°30′N. 3°04′W. (Lancashire)
P.	pull.	20.6.60	Cap Frehel: 48°41′N. 2°19′W. (Côtes-du-Nord) **France**
EK3815	×	26.6.61	Morecambe: 54°04′N. 2°53′W. (Lancashire)

Woodpigeon (*Columba palumbus*)

L.	ad. ♂	1.12.59	Texel Lightship: 53°01′N. 4°01′E. North Sea
382260	+	0.2.61	Oulton Broad: 52°28′N. 1°44′E. (Suffolk)

Swallow (*Hirundo rustica*)

J.B.O.	ad.	8.5.56	Herm: 49°29′N. 2°27′W. **Channel Islands**
A5488	/?/	19.5.56	Omagh: 54°35′N. 7°20′W. (Tyrone)
J.B.O.	ad.	9.5.58	St. Ouen: 49°13′N. 2°13′W. Jersey, **Channel Islands**
A8676	+	0.7.60	Bagenalstown: 52°40′N. 6°57′W. (Carlow)
J.B.O.	ad.	15.4.60	St. Ouen, **Channel Islands**
K2139	×	16.7.60	Cashel: 52°30′N. 7°55′W. (Tipperary)
J.B.O.	juv.	9.9.60	St. Ouen, **Channel Islands**
K3970	× (*cat*)	8.6.61	Manaton: 50°35′N. 3°40′W. (Devon)

Fieldfare (*Turdus pilaris*)

Hki.	pull.	17.6.60	Rovaniemi: 66°30′N. 25°45′E. **Finland**
A24123	v	11.1.61	Leicester: 52°39′N. 1°10′W.
St. Orn.	pull.	2.6.61	Sundsvall: 62°23′N. 17°21′E. (Västernorrland) **Sweden**
716566	×	27.12.61	Great Yarmouth: 52°36′N. 1°45′E. (Norfolk)

Song Thrush (*Turdus philomelos*)

H.	juv.	4.6.59	Wangeroog: 53°48′N. 7°52′E. East Frisian Islands, **Germany**
7359518	×	0.12.61	Stubbington: 50°50′N. 1°14′W. (Hampshire)
Pe.	pull.	12.5.53	Prague: 49°58′N. 14°24′E. **Czechoslovakia**
K133254	×	16.10.53	Casquets Lighthouse: 49°41′N. 2°22′W. Channel Islands

Redwing (*Turdus iliacus*)

Hki.	pull.	27.5.61	Tampere: 61°28′N. 23°45′E. **Finland**
A140654	v	31.12.61	Seahouses: 55°35′N. 1°39′W. (Northumberland)
M.	pull.	27.6.60	Lake Engure: 57°10′N. 23°13′E. **Latvian S.S.R.**
F313910	×	1.2.61	Acle: 52°38′N. 1°34′E. (Norfolk)
Rk.	f.g.	30.10.60	Reykjavik: 64°08′N. 21°56′W. **Iceland**
816869	v	7.11.60	North Atlantic Ocean: 49°24′N. 17°05′W.
Rk.	f.g.	10.10.61	Reykir: 64°09′N. 21°40′W. **Iceland**
811599	×	11.12.61	Elgin: 57°39′N. 3°18′W. (Moray)

Blackbird (*Turdus merula*)

Hki.	♀	11.10.59	Helsinki: 60°09′N. 24°57′E. **Finland**
B30915	×	27.12.59	Wakefield: 53°42′N. 1°29′W. (York)

Hki.	pull.	24.5.61	*near* Turku: 60°25′N. 22°13′E. **Finland**
A123352	×	0.11.61	Rollesby: 52°41′N. 1°38′E. (Norfolk)
M.	pull.	19.6.60	Puhtu: 58°34′N. 23°34′E. **Estonian S.S.R.**
F752304	× (*cat*)	28.1.61	Fordham: 51°56′N. 0°49′E. (Essex)
Rk.	f.g.	19.10.61	Kvísker: 63°59′N. 16°27′W. **Iceland**
77062	× (*cat*)	3.11.61	Kincasslagh: 55°02′N. 8°23′W. (Donegal)
Stav.	ad. ♂	9.4.60	Line: 58°43′N. 5°38′E. (Rogaland) **Norway**
770408	()	0.12.60	Kincon: 54°13′N. 9°19′W. (Mayo)
Stav.	ad. ♂	8.4.60	Line, **Norway**
752590	×	15.11.61	North Rode: 53°12′N. 2°09′W. (Cheshire)
St.	1stW. ♀	3.12.60	Råbelöv: 56°19′N. 14°12′E. (Skåne) **Sweden**
5002451	v	5.11.61	Foulness Island: 51°36′N. 0°55′E. (Essex)
St. Orn.	1stW. ♂	18.10.60	Fritsla: 57°30′N. 12°45′E. (Västergötland) **Sweden**
711860	× (*wires*)	5.12.61	Lowca: 54°36′N. 3°35′W. (Cumberland)
St. Orn.	ad. ♂	5.4.61	Åseda: 57°10′N. 15°20′E. (Småland) **Sweden**
706499	×	29.12.61	Gravesend: 51°26′N. 0°22′E. (Kent)
St. Orn.	ad. ♂	31.3.61	Bohus: 57°51′N. 12°02′E. **Sweden**
704555	×	0.12.61	Yeovil: 50°57′N. 2°39′W. (Somerset)
H.	ad. ♂	14.4.58	Heligoland: 54°11′N. 7°55′E. **Germany**
7308508	×	2.3.61	Aspatria: 54°45′N. 3°20′W. (Cumberland)
H.	ad. ♀	4.10.59	Heligoland, **Germany**
7355684	×	0.12.61	Bantry: 51°41′N. 9°27′W. (Cork)
H.	ad. ♀	1.11.59	Heligoland, **Germany**
7357033	v	31.12.61	Adwick-le-Street: 53°34′N. 1°11′W. (York)
H.	1stW. ♂	27.11.59	Heligoland, **Germany**
7357686	×	0.12.61	Abbeydorney: 52°21′N. 9°42′W. (Kerry)
H.	ad. ♀	4.4.60	Heligoland, **Germany**
7379830	v	26.10.61	Spurn Point: 53°35′N. 0°06′E. (York)
H.	ad. ♀	1.11.60	Wangeroog: 53°48′N. 7°52′E. East Frisian Islands, **Germany**
7332693	v	22.1.61	Leigh-on-Sea: 51°33′N. 0°39′E. (Essex)
L.	1stW. ♂	9.11.58	Vlieland: 53°16′N. 4°58′E. **Netherlands**
K93729	v	18.1.61	Walton-on-the-Naze: 51°51′N. 1°18′E. (Essex)
L.	♀	9.10.61	Texel: 53°06′N. 4°48′E. **Netherlands**
K120353	×	*c.* 26.12.61	Pembroke Dock: 51°42′N. 4°56′W.

In the "Report on bird-ringing for 1960" (*Brit. Birds,* 54: 482) there appeared the first record of a Blackbird crossing from Great Britain to Iceland, and Reykjavik 77062 above is the first example of a journey in the opposite direction, namely from Iceland to Ireland.

Robin (*Erithacus rubecula*)

L.	1stW.	23.10.60	Amsterdam: 52°22′N. 4°55′E. **Netherlands**
N34620	v	6.4.61	Fair Isle: 59°32′N. 1°37′W. (Shetland)
J.B.O.	ad.	11.3.58	St. Aubin: 49°11′N. 2°10′W. Jersey, **Channel Islands**
A5417	×	21.10.58	Hove: 50°50′N. 0°11′W. (Sussex)

Reed Warbler (*Acrocephalus scirpaceus*)

J.B.O.	f.g.	22.9.59	St. Ouen: 49°13′N. 2°13′W. Jersey, **Channel Islands**
K1739	v	15.6.61	Attenborough: 52°54′N. 1°14′W. (Nottingham)

R.	juv.	28.8.60	Leipzig: 51°20′N. 12°23′E. (Sachsen) **Germany**
H402170	v	23.9.60	St. Ouen, **Channel Islands**

Sedge Warbler (*Acrocephalus schoenobaenus*)

J.B.O.	juv.	18.8.58	St. Ouen: 49°13′N. 2°13′W. Jersey, **Channel Islands**
A9400	v	16.5.60	Great Saltee: 52°07′N. 6°35′W. (Wexford)

Blackcap (*Sylvia atricapilla*)

R.	♂	6.8.61	Puchenau: 48°19′N. 14°14′E. (Linz) **Austria**
H600812	× (*cat*)	14.12.61	Greystones: 53°08′N. 6°04′W. (Wicklow)

Whitethroat (*Sylvia communis*)

P.	1stW.	8.9.60	Ushant: 48°28′N. 5°05′W. (Finistère) **France**
35002	×	5.6.61	County Longford

The dead body of this bird was found caught on the radiator of a motor-car and it is impossible to say where it was killed.

Chiffchaff (*Phylloscopus collybita*)

J.B.O.	ad.	5.10.57	St. Ouen: 49°13′N. 2°13′W. Jersey, **Channel Islands**
A8330	×	20.4.58	Ashburton: 50°31′N. 3°45′W. (Devon)

Spotted Flycatcher (*Muscicapa striata*)

H.	ad.	29.5.59	Heligoland: 54°11′N. 7°55′E. **Germany**
9794275	× (*cat*)	11.6.61	Sutton Valence: 51°12′N. 0°36′E. (Kent)

Meadow Pipit (*Anthus pratensis*)

P.	ad.	26.9.57	Ahetze: 43°23′N. 1°33′W. (Basses-Pyrénées) **France**
JA0491	×	0.4.61	Hyndhope: 55°30′N. 2°58′W. (Selkirk)

Rock Pipit (*Anthus spinoletta*)

Stav.	pull.	11.7.57	Fjell: 60°20′N. 5°14′E. (Hordaland) **Norway**
951281	×	2.1.61	Anstruther: 56°13′N. 2°41′W. (Fife)

Pied/White Wagtail (*Motacilla alba*)

J.B.O.	1stW.	24.11.58	St. Ouen: 49°13′N. 2°13′W. Jersey, **Channel Islands**
A7259	/?/	0.4.59	Minehead: 51°13′N. 3°28′W. (Somerset)

Yellow Wagtail ssp. (*Motacilla flava*)

J.B.O.	juv.	14.9.58	St. Ouen: 49°13′N. 2°13′W. Jersey, **Channel Islands**
A8299	+	4.8.59	Durham: 54°47′N. 1°34′W.

Starling (*Sturnus vulgaris*)

M.	pull.	5.6.60	Darwin Reserve: 58°30′N. 37°30′E. (Rybinsk) **U.S.S.R.**
F695587	×	10.1.61	Aldeburgh: 52°09′N. 1°36′E. (Suffolk)

M.	pull.	2.6.60	Darwin Reserve, **U.S.S.R.**
F695381	+	0.8.61	Pennington: 50°45′N. 1°34′W. (Hampshire)
M.	pull.	29.5.59	Gryazovets: 58°53′N. 40°10′E. (Vologodsk) **U.S.S.R.**
F579199	×	1.2.61	Hythe: 51°04′N. 1°06′E. (Kent)
Hki.	pull.	27.5.61	Hattula: 61°06′N. 24°26′E. **Finland**
A119236	×	30.10.61	Haisbro' Light-vessel: 52°58′N. 1°34′E. (Norfolk)
Hki.	pull.	10.6.60	Lempäälä: 61°23′N. 23°46′E. **Finland**
A126946	×	1.2.61	Roscommon: 53°37′N. 8°13′W.
St.	ad. ♀	27.5.59	Visnum: 59°06′N. 14°07′E. (Värmland) **Sweden**
YP5387	v	5.3.61	Lincoln: 53°14′N. 0°32′W.
St. Orn.	pull.	20.5.61	Bogesund: 59°24′N. 18°17′E. (Uppland) **Sweden**
209090	v	2.12.61	Knaresborough: 54°01′N. 1°28′W. (York)
G.	ad.	8.6.58	Sundsvall: 62°23′N. 17°21′E. (Västernorrland) **Sweden**
B54453	+	16.1.61	Duns: 55°46′N. 2°20′W. (Berwick)
Stav.	pull.	23.5.57	Sokndal: 58°20′N. 6°17′E. (Rogaland) **Norway**
442223	+	(26.2.60)	Ombersley: 52°16′N. 2°14′W. (Worcester)
Skov.	pull.	28.5.60	Aalborg: 57°03′N. 9°55′E. (Jutland) **Denmark**
T37591	()	1.3.61	Newark: 53°04′N. 0°49′W. (Nottingham)
L.	pull.	8.5.57	Meppel: 52°42′N. 6°11′E. (Drente) **Netherlands**
D71460	×	14.12.57	Gloucester: 51°52′N. 2°14′W.

Greenfinch (*Chloris chloris*)

H.	ad. ♂	30.11.59	Heligoland: 54°11′N. 7°55′E. **Germany**
3357691	×	5.5.61	Lincolnshire
I.B.O.	ad. ♀	19.3.60	St. Ouen: 49°13′N. 2°13′W. Jersey, **Channel Islands**
B34932	×	25.7.60	Saxmundham: 52°12′N. 1°30′E. (Suffolk)

The body of the first Greenfinch was found lying on the front of a diesel train running between Lincoln (53°14′N. 0°32′W.) and Grantham (52°54′N. 0°38′W.).

Siskin (*Carduelis spinus*)

H.	1stW. ♀	26.9.61	Haan: 51°12′N. 7°01′E. (Rheinland) **Germany**
224125	×	14.10.61	Slough: 51°31′N. 0°36′W. (Buckingham)
P.	♂	29.10.61	Vannes: 47°40′N. 2°44′W. (Morbihan) **France**
71791	×	16.11.61	Sutton-in-Ashfield: 53°08′N. 1°16′W. (Nottingham)

Linnet (*Carduelis cannabina*)

San S.	ad.	15.3.61	Fuenterrabía: 43°21′N. 1°48′W. (Guipúzcoa) **Spain**
A19590	×	30.6.61	Plaxtol: 51°16′N. 0°19′E. (Kent)

Twite (*Carduelis flavirostris*)

..	♀	16.11.60	Walcheren: 51°27′N. 3°38′E. (Zeeland) **Netherlands**
N53658	×	6.5.61	Denholme: 53°47′N. 1°53′W. (York)

Chaffinch (*Fringilla coelebs*)

I.	f.g.	11.10.58	Ribatschi: 55°11′N. 20°49′E. (Kaliningrad) **U.S.S.R.**
3809651	v	16.12.61	West Malling: 51°18′N. 0°24′E. (Kent)

G.	f.g.	17.7.55	Norrköping: 58°35′N. 16°10′E. (Östergötland) **Sweden**
105427	×	28.12.61	Cork: 51°54′N. 8°29′W.
H.	1stW. ♀	23.9.60	Heligoland: 54°11′N. 7°55′E. **Germany**
80042576	×	Sept./Oct. 61	Hartlepool: 54° 43′N. 1°10′W. (Durham)
L.	♀	21.10.61	Westen Schouwen: 51°41′N. 3°41′E. (Zeeland) **Netherlands**
N23778	v	29.10.61	Havering: 51°38′N. 0°12′E. (Essex)
B.	f.g.	12.3.60	Ekeren: 51°17′N. 4°25′E. (Antwerp) **Belgium**
32B9018	×	2.3.61	Weymouth: 50°36′N. 2°27′W. (Dorset)
B.	♂	7.11.60	Ekeren, **Belgium**
37B170	×	5.3.61	Berkhamsted: 51°46′N. 0°34′W. (Hertford)
B.	ad. ♀	12.11.60	Putte: 51°24′N. 4°24′E. (Antwerp) **Belgium**
34B8774	×	9.11.61	Port Talbot: 51°36′N. 3°48′W. (Glamorgan)
B.	♂	24.9.59	Baarle-Hertog: 51°26′N. 4°56′E. (Antwerp) **Belgium**
31B4013	/?/	1.4.60	Harwich: 51°57′N. 1°18′E. (Essex)
B.	f.g.	10.11.58	Frasnes: 50°05′N. 4°30′E. (Namur) **Belgium**
26B1402	×	(10.3.61)	Welbeck Abbey: 53°16′N. 1°09′W. (Nottingham)

The Heligoland Chaffinch was found dead on the deck of a ship docked at Hartlepool and had probably alighted on board somewhere in the North Sea, but nothing definite could be learnt about it.

Brambling (*Fringilla montifringilla*)

B.	ad.	13.2.60	Arendonk: 51°18′N. 5°03′E. (Antwerp) **Belgium**
31A9247	×	17.11.61	*off* Rockabill Lighthouse: 53°36′N. 6°00′W. (Dublin)

Corrigenda

1958 REPORT (BRIT. BIRDS, 52: 459)

Scaup (*Aythya marila*)

AF5406	f.g. ♂	28.2.54	Cley
	+	25.5.58	Ust-Tsilma: 65°26′N. 52°11′E. (Komi) **U.S.S.R.**

1959 REPORT (BRIT. BIRDS, 53: 491)

Song Thrush (*Turdus philomelos*)

R47005	1stW.	5.9.59	Dungeness
	+	30.12.59	*near* Oliveira do Hospital: 40°21′N. 7°52′W. (Beira-Alta) **Portugal**

1960 REPORT (BRIT. BIRDS, 54: 471 and 488)

Common Gull (*Larus canus*)

3000111	pull.	13.7.55	Great Blasket: 52°05′N. 10°32′W. (Kerry)
	+	10.9.57	Betanzos: 43°17′N. 8°13′W. (Coruña) **Spain**

Yellow Wagtail ssp. (*Motacilla flava*)

Jso8ss	ad. ♀	12.8.59	East Tilbury: 51°28′N. 0°26′E. (Essex)
	+	2.10.60	*near* Loures: 38°50′N. 9°10′W. (Estremadura) **Portugal**

Bird observatories in Great Britain and Ireland

This list is arranged alphabetically and is designed to give (i) the name of the warden or director where there is one; (ii) the address from which particulars may be obtained; and (iii) an indication of accommodation charges and travel routes (charges are, of course, liable to alteration). *Stamped reply envelopes should be sent with applications for particulars.*

Bardsey Bird and Field Observatory, Caernarvonshire. Resident warden. *Enquiries:* G. C. Lambourne, The Cottage Farm, Ipsley, Redditch, Worcestershire. *Accommodation:* 11s. per day (including evening meal). *Travel:* train to Pwllheli; boat from Aberdaron (10s. return, plus island landing charge of 15s.).

Bradwell Bird Observatory, Essex. *Enquiries:* A. B. Old, Bata Hotel, East Tilbury, Essex. *Accommodation:* 2s. 6d. to 4s. per night. *Travel:* train to Southminster; bus to Bradwell-on-Sea.

Cape Clear Bird Observatory, Co. Cork. *Enquiries:* H. M. Dobinson, Old Barn, Sonning Common, Reading, Berkshire. *Accommodation:* 5s. per night or 30s. per week, in newly acquired house. *Travel:* bus from Cork to Baltimore; boat from Baltimore four days a week (8s. return).

Cley Bird Observatory, Norfolk. *Hon. Warden:* R. A. Richardson, Hill Top, Cley, Holt, Norfolk. *Enquiries:* The Green Farm House, Cley, Holt, Norfolk. *Accommodation:* cottage or hotel in Cley. *Travel:* train to Holt; bus to Cley (four miles).

Copeland Bird Observatory, Co. Down. *Enquiries:* C. W. Bailey, 17 Hillside Drive, Belfast 9, Northern Ireland. *Accommodation:* 2s. 6d. per day (maintenance charge to non-members). *Travel:* bus and boat from Belfast (11s. 7d. return).

Dungeness Bird Observatory, Kent. *Warden:* R. E. Scott. *Enquiries:* H. A. R. Cawkell, 6 Manute Road, Hastings, Sussex. *Accommodation:* 5s. per night. *Travel:* train to Lydd-on-Sea.

Fair Isle Bird Observatory, Shetland. *Warden:* Peter Davis, Fair Isle Bird Observatory, by Lerwick, Shetland. *Enquiries* to warden. *Accommodation:* 15s. to 20s. per day (including full board). *Travel:* train to Aberdeen; steamer from Aberdeen to Lerwick or B.E.A. aeroplane from Aberdeen to Sumburgh; boat from Sumburgh to Fair Isle (21s. 6d. return).

Gibraltar Point Bird Observatory and Field Research Station, Lincolnshire. *Enquiries:* A. E. Smith, Pyewipes, Willoughby, Alford, Lincolnshire (bookings) and R. K. Cornwallis, Gleasby Grange, Legsby, Market Rasen, Lincolnshire (research). *Accommodation:* 6s. per night. *Travel:* train to Skegness.

Great Saltee Bird Observatory, Co. Wexford. *Enquiries:* F. King, The Orchards, Blennerville, Tralee, Co. Kerry, Ireland. *Accommodation:* 2s. 6d. per night. *Travel:* boat from Fishguard to Rosslare; train from Rosslare to Bridgetown; boat to island (20s. return).

Isle of May Bird Observatory and Field Station, Fife. *Enquiries:* A. Macdonald, Hadley Court, Sidegate, Haddington, East Lothian (bookings) or Miss N. J. Gordon, 12 Hope Terrace, Edinburgh 9 (general). *Accommodation:* 5s. per night. *Travel:* train to Pittenweem; boat to island (15s. return).

Jersey Bird Observatory, Channel Islands. *Enquiries:* A. le Sueur, 6 York Street Chambers, St. Helier, Jersey. *Accommodation:* 7 gns. to 9 gns. per week (including full board), in seaside café or elsewhere locally. *Travel:* boat from Weymouth (approximately £4 14s. 6d., 2nd class return) or by air.

Lundy Field Station and Observatory, Devon. *Warden:* Michael Jones. *Enquiries:* J. Dyke, 1 Rock Avenue, Barnstable, Devon. *Accommodation:* 5s. per night. *Travel:* train to Bideford; M.V. *Lundy Gannet* from Bideford Quay (50s. return) or Campbell Steamer from Ilfracombe Pier (7s. return).

New Grounds, Slimbridge, Gloucestershire (Headquarters of the Wildfowl Trust). *Hon. Director:* Peter Scott; *Assistant Director (Research):* Dr. G. V. T. Matthews. *Enquiries:* Bookings Secretary, Wildfowl Trust, Slimbridge, Gloucestershire.

Portland Bird Observatory and Field Centre, Dorset. *Warden:* Frank Clafton, Portland Bird Observatory, The Old Low Light, Portland, Dorset. *Enquiries* to warden. *Accommodation:* 5s. per night. *Travel:* train to Weymouth; bus to Portland Bill.

St. Agnes Bird Observatory, Isles of Scilly. *Enquiries:* J. L. F. Parslow, c/o The Edward Grey Institute, Botanic Garden, Oxford. *Accommodation:* 4s. 6d. per night. *Travel:* R.M.V. *Scillonian* from Penzance to St. Mary's (37s. 6d. return), or by air from Plymouth or Land's End to St. Mary's; launch from St. Mary's to St. Agnes (4s.).

Sandwich Bay Bird Observatory, Kent. *Enquiries:* J. Websper, 41 Sussex Avenue, Margate, Kent.

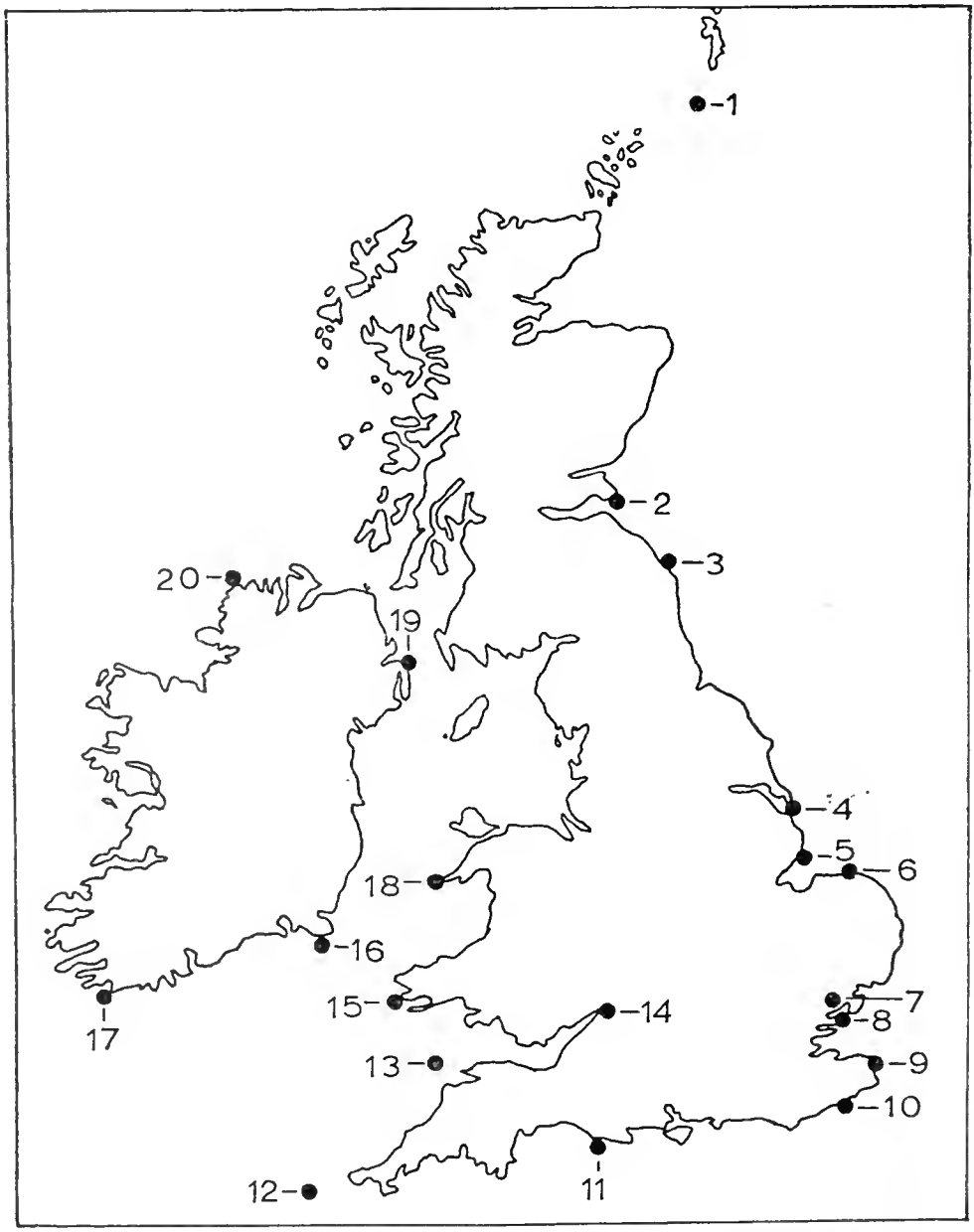
Skokholm Bird Observatory, Pembrokeshire. *Warden:* M. P. Harris. *Enquiries:* The Warden, Dale Fort Field Centre, Haverfordwest, Pembrokeshire. *Accommodation:* £8 per week (including full board), amateurs £7 10s. *Travel:* train to Haverfordwest: car and boat to island (20s. return).

Spurn Bird Observatory, Yorkshire. *Warden:* P. J. Mountford. *Enquiries:* G. H. Ainsworth, 44 Gillshill Road, Hull, Yorkshire. *Accommodation:* 4s. per night (3s. to Y.N.U. members). *Travel:* train to Hull and bus to Kilnsea, or train to Patrington and taxi or bus to Kilnsea.

(*Continued overleaf*)

Tory Island Bird Observatory, Co. Donegal. *Enquiries:* R. G. Pettitt, 77 Moss Lane, Pinner, Middlesex. *Accommodation:* 20s. per week. *Travel:* train to Londonderry or Strabane; bus to Magheroughty; boat to island (20s. return).

In addition to the above observatories, representatives from each of which form the Bird Observatories Committee, there are several which have not yet applied for formal recognition. These include the Calf of Man (I.o.M.) and Walberswick (Suffolk). Enquiries concerning these stations may be made through the Ringing Officer, Bird-Ringing Committee, c/o British Museum (Natural History), Cromwell Road, London, S.W.7.



Map to show positions of bird observatories and two other ringing localities (Farne Islands and Abberton Reservoir) whose co-ordinates are omitted from the body of the "Report on bird-ringing"

1	Fair Isle	6	Cley	11	Portland	16	Great Saltee
2	Isle of May	7	Abberton	12	St. Agnes	17	Cape Clear
3	Farne Islands	8	Bradwell	13	Lundy	18	Bardsey
4	Spurn Point	9	Sandwich Bay	14	Slimbridge	19	Copeland
5	Gibraltar Point	10	Dungeness	15	Skokholm	20	Tory Island

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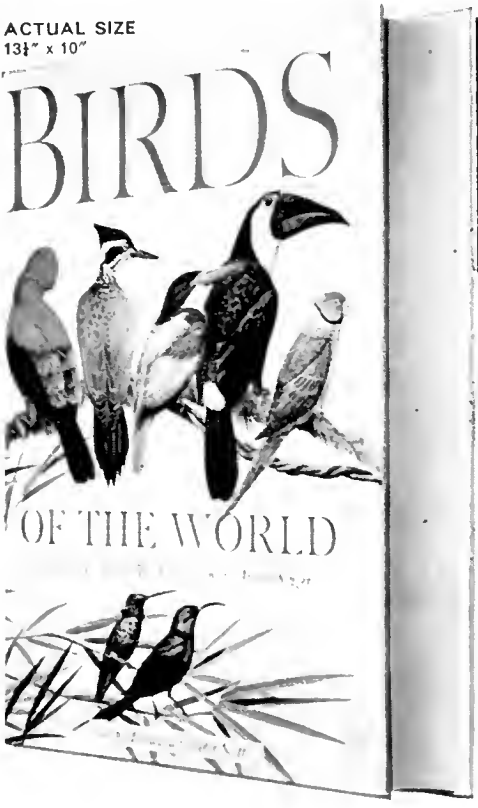

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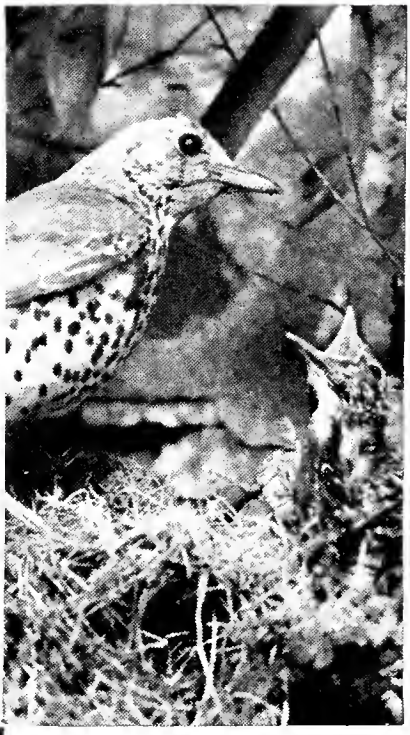

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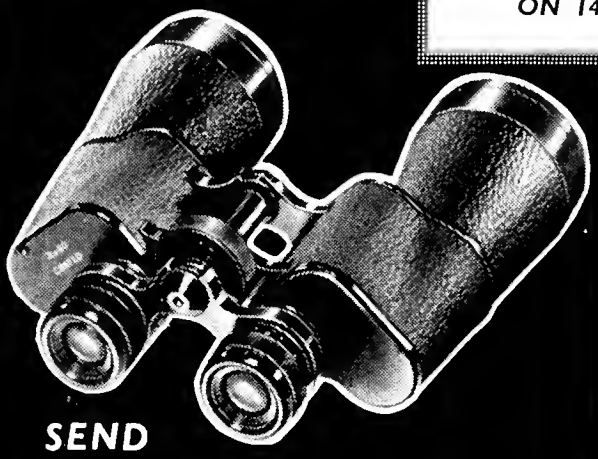

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PLATE 80. Grey Plover (*Pluvialis squatarola*) with the whitish spangling and bold black of summer plumage, 2nd August 1962 (pages 584–589) (*photo: Eric Hosking*)

British Birds

Vol. 55 No. 12

DECEMBER 1962

Editorial

Sight records of unusual birds

IT IS OVER TEN YEARS since we devoted a brief editorial (*Brit. Birds,* 45: 1-2) to the need for painstaking and conscientious treatment of sight records of rare or unusual birds, both by observers and by scrutinisers, and listed some points to be borne in mind when making and submitting observations.

During this past decade the great increase in the flow of records has led to the formation of the Rarities Committee, one of the main purposes of which is to achieve a measure of uniformity in the standards by which observations of rarer birds are judged. At the same time, however, while more and more observers of widely differing experience and capabilities are sending in an ever-growing number of records of varying merits, the limitations of space prevent the full publication of supporting notes in the cases of all but a handful of the rarest species. Nowadays, therefore, we do not have published accounts providing so continual a reminder of the need to record *all* details of rarities, and giving guidance in the way it should be done. Indeed, it is clear from the form in which identifications of unusual birds are being submitted, both to local societies and to national bodies, that many people are either ignoring or ignorant of a number of the points to which attention should be paid. This is causing busy voluntary officers of records committees throughout the country much extra work and correspondence, and is also resulting in the loss of an unnecessarily large quantity of good records because they cannot be established beyond the "probable" stage.

The assessment of records has always been a difficult task and it becomes increasingly so as the number of observers grows. Much as one might wish it could be otherwise, it has been proved all too often that the consideration of a record must take account of the source from which it comes. Some observers, even of long experience,

remain erratic or unreliable and for this reason no record of a really rare bird, however word-perfect, can in any circumstances be safely accepted from an unknown person for whom other bird-watchers are not in a position to vouch. The observer who has begun his career by accurately reporting the more usual birds of his neighbourhood to his local society will have gone a long way towards establishing his reliability, and he will have gathered valuable practical experience in presenting records by the time he meets a rarity.

It goes without saying that the more an observer can learn, especially from field experience, about the critical features of a particular species and of anything confusable with it, the more likely he is to be able to identify it and to convince others that he has done so. On the other hand, familiarity abroad with a bird rare in Britain is no substitute for a description.

The standard of accuracy which is expected by records committees throughout the British Isles is probably higher now than it has ever been. Some may feel that this has detracted from the joys of bird-watching, but the fact remains that we must all endeavour to attain this standard if our observations are to be considered reliable. Even then, especially in the cases of birds which are particularly difficult to identify or exceptionally far from their normal range, the unsupported evidence of a single (although good) observer may not justify the acceptance of a record, and attempts should always be made to get others to substantiate a rarity.

If the aim is to eliminate all erroneous and doubtful records, it is inevitable that some genuine occurrences will also be rejected as insufficiently proven, even when submitted by well-known and experienced observers. But most people prefer this to killing rare birds or to allowing the perpetuation of dubious records.

It is sometimes held that the reporting and checking of rarities is a waste of time and "unscientific". Nevertheless, the great increase in this kind of study in recent years has clearly shown that many species tend to wander beyond their normal areas to a far larger extent than was formerly believed, and there can be no doubt that knowledge of these movements is likely to contribute to our understanding of such topics as geographical distribution and the effects of weather on migration. Most bird-watchers will therefore appreciate the need for meticulous detail, and do their best to supply it, recognising the difficulties involved in the sifting of the information and the value and interest of maintaining reliable records. Incidentally, a bird which is regular in one part of the British Isles may be unknown in another, and a bird universally common in summer may be quite exceptional in winter; in either case, evidence of identification should be forthcoming as for a more conventional rarity.

Coming now to specific points which must be borne in mind when making and submitting observations of rarities, we cannot over-emphasise the importance of the observer's integrity and self-discipline. The names of the parts of a bird's plumage should be learnt so that colours of nape, mantle, wing-coverts, tail-coverts and so on can be accurately pinpointed and *full details taken down on the spot, before any work of reference has been consulted.* It is useless to make insufficient notes in the field and then to work up an account of what was seen after the bird's supposed illustration or description has been found in a book. No observer should allow himself to imagine that he can see a shape, colour or pattern when distance, poor light or movement prevent certainty, just because he thinks a particular feature should be shown by the species he believes he is looking at; it may have been misidentified anyway. Similarly, all field notes should be included in the record when it is submitted, even if it is thought some points militate against the identification claimed; every text book is inaccurate or incomplete to some degree and the repetition of such imperfections makes an observation suspect. Field sketches should be originals or faithful copies, however bad, and not "improved" versions drawn from memory after a book has been consulted. Each observer should try to make his own critical assessment of any species pointed out to him and take independent notes on it; he should also remember that he may not be the only person to see a bird which he "discovers". The Rarities Committee sometimes comes across clear cases of conscious or unconscious departures from the facts, as, for example, when a bird is subsequently trapped and proves to be entirely lacking features reported in an earlier field description. In the case of trapped birds, incidentally, measurements and wing-formulae should be added to, and not substituted for, full descriptions.

THE IDEAL RECORD

Field-notes taken during the observation:

(1) Form and structure (size and shape of bill, length of legs, shape of wings, length of tail, etc.) in comparison with known species at all similar.

(2) Size, and whether estimated or directly compared with other birds or objects.

(3) Exact position of any distinctive white or colour patches or other markings.

(4) Description of whole plumage as far as possible (not only parts thought likely to assist identification); field-sketches, even if totally lacking artistic merit, are useful for illustrating special points.

(5) Colours of bill, legs and feet, also eyes if determinable.

(6) Actions and flight compared with other species.

(7) Call-notes, especially quality (harsh, rattling, shrill, hoarse, liquid, etc.) and comparison with other species.

Field-notes taken immediately after the observation:

(1) Associated birds (if any).

(2) Nature of ground, and use made by bird of any cover.

(3) Distance from bird, and how calculated.
(4) Whether binoculars used and, if so, what power.
(5) Nature and direction of light, and other conditions affecting observation (wing-strength, visibility, etc.).
(6) Whether bird seen from different angles, at rest or in flight, from above or below, wholly visible or partly obscured.
(7) Duration of observation.

Details added when the observation is submitted:
(1) Previous experience of same species at home or abroad (familiarity should not be claimed when, in fact, it has been glimpsed only briefly years before).
(2) Previous experience of other species with which confusion seems possible.
(3) Steps taken to obtain confirmation by other, preferably experienced, observers.
(4) Name(s) and address(es) of experienced ornithologist(s) who can vouch for the observer if he is unknown to the body to which the record is being submitted.

Fox Sparrow in Co. Down: a bird new to Great Britain and Ireland

By John Wilde
Copeland Bird Observatory

On 3rd June 1961 I was showing some visitors round the buildings of the bird observatory on Copeland, Co. Down, when I noted a bird rather larger than a Rock Pipit (*Anthus spinoletta*) mobbing a Cuckoo (*Cuculus canorus*) which was perched on a small sapling about a hundred yards away. Unfortunately it was almost directly into the sun and I was without my binoculars; by the time I had fetched them the bird had disappeared. Later that day, however, what was presumably the same bird was seen with the Cuckoo near our largest Heligoland trap, this time by Miss E. K. Addy who, failing to recognise it, managed to drive it in and catch it with the assistance of D. Barr and others.

Our drill in cases such as this is to have the bird examined by two teams, each of which weighs, measures and describes it. The two descriptions are then compared and any differences resolved by reference back to the bird. In this instance the teams consisted of Miss M. P. Macmillan and D. Barr, and Miss E. K. Addy and myself. The agreed description was as follows:

> Crown, nape and sides of neck grey with specks of warm brown where the tips of some feathers were not abraded. Cheeks chestnut, this colour extending up to the ear-coverts; there was a vague whitish fringe to this cheek patch, running backwards from the bill. Mantle olive-brown slightly blotched with

chestnut and dark brown. Rump and upper tail-coverts bright chestnut. Outer webs of tail-feathers chestnut, inner webs darker and duller brown; the outer webs of the two outermost feathers, though much abraded, showed a hint of light buffish edging. Chin silvery-white with a few small speckles of brown. Throat and breast also silvery-white but with larger, longer and heavier spots of chestnut, these becoming darker and duller brown on the sides and flanks. Belly greyish-white with a few small dark brown speckles. Under tail-coverts light buffish with brown spots. Outer webs of primaries and secondaries dark chestnut, inner webs dark brown becoming lighter, almost grey, at edges; primary-coverts uniform dark brown; greater and median coverts light to rich chestnut on outer webs, with whitish edges near tips, and dark brown on inner webs; lesser coverts largely rich chestnut; under wing-coverts silvery-white with greyish-brown markings. *Soft parts:* bill stout and strong with minute bristles around base, upper mandible greyish-brown and lower pinkish-grey; iris dark brown; legs and feet brownish-pink. *Measurements:* wing 86 mm., tail 70 mm., tarsus 26.5 mm., bill 15 mm., total length 173 mm.; weight 40.28 gm. *Wing-formula:* 3rd and 4th primaries equal and longest, 5th 2 mm. shorter, 6th 4 mm. shorter, 2nd 4.5 mm. shorter, 1st minute (barely perceptible); 3rd to 6th emarginated.

The bird's short, stout bill gave it all the appearance of a bunting. From the side its coloration produced a momentary impression of a much undersized female Fieldfare (*Turdus pilaris*), while from above it looked more like a very large Dunnock (*Prunella modularis*).

The bird was duly released, but neither then nor the next day, 4th June, when it was seen briefly on a wall and later found again in the trap, were any good views of it obtained in the field. It was noticed that it had a very upright stance, however, and all observers commented on its slimness. Its weight on the second day showed a negligible change.

From the laboratory description it appeared to be a Fox Sparrow (*Passerella iliaca*), one of the largest of the North American buntings which breeds from Alaska to Quebec and Newfoundland (and, in the west, down as far as California). But I was worried by the fact that in all the books to which I could obtain access the crown and nape were given as rufous or brown, whereas our bird was mostly grey on these parts. Since then, however, Kenneth Williamson has been good enough to check the description against skins in the British Museum (Natural History) and has written to say that it seems to be only fresh plumage which is generally described in the literature; the specimens in the British Museum show that by April and May most individuals have the rufous feather tips almost entirely abraded, with the result that the head, nape and sides of the neck become a "Dunnock-grey". The wing-formula of the Copeland bird falls within the range of variation of six Fox Sparrows which he measured.

[This species is an early migrant (March to mid-April) and a late May crossing of the Atlantic under its own power seems most unlikely.

It is much more probable that the Copeland bird either came over some weeks before it was discovered or that it was a passenger on a ship. The possibility of "assisted passage" does not now deny a bird admittance to the British List, however, provided that the likelihood of escape from captivity can be ruled out (see, for example, *Brit. Birds,* 48: 146-147; *Ibis,* 98: 156-157). In this connection we made enquiries through Derek Goodwin and R. A. Richardson, and they both informed us in November 1961 that they had not heard of any Fox Sparrows being sold or kept in captivity over here. Finally, it is interesting to note that the weight of the Copeland bird (40.28gm.) is identical with the average of sixteen adult Fox Sparrows weighed in North America by Mrs. K. B. Wetherbee between 21st March and 21st April (*Bird-Banding,* 5: 60-61); the range she recorded was 29.59-47.38 gm.—EDS.]

Report on rare birds in Great Britain in 1961 (with 1959 and 1960 additions)

Compiled by C. M. Swaine on behalf of the Rarities Committee

THIS, THE FOURTH REPORT of the Rarities Committee, has now been prepared after the consideration of about 450 records which were submitted for the year 1961, together with a few outstanding ones for the two previous years. We thus had to deal with slightly fewer records than in 1960. We have come to a decision on nearly all of these, but a few, for various reasons, are still outstanding. As explained in our last report (*Brit. Birds,* 54: 173-200), we no longer adjudicate on Irish records, but we have been glad to give assistance in a number of cases when asked to do so. The present report, therefore, lists the accepted 1961 records from England, Scotland and Wales.

The composition of the Committee is now as follows: P. A. D. Hollom (Chairman), C. M. Swaine (Hon. Secretary), H. G. Alexander, D. G. Bell, I. J. Ferguson-Lees, D. D. Harber, M. F. M. Meiklejohn, I. C. T. Nisbet, G. A. Pyman and Kenneth Williamson. The present Hon. Secretary took over from G. A. Pyman in June 1961 and would like to take this opportunity of expressing personal appreciation of the smooth way in which the change was made, due chiefly to the perfect order in which his predecessor left his files.

We were glad to retain the services of G. A. Pyman as an ordinary member; also to welcome D. G. Bell who joined us early in 1962 and who provides a useful link with the north-east. The unexpected death of Alfred Hazelwood in December 1961 deprived us of an able and clear-sighted colleague whose loss is sadly felt; we should also like to express our appreciation of the work done by K. D. Smith, who resigned early in the summer of 1961.

The list of species which come under the notice of this Committee has not been altered since it was published in our last report (see *Brit. Birds,* 54: 197-198) and we still intend to consider, in addition, certain well-marked geographical races of rare occurrence in Britain. However, we have omitted from this report the several records of Flamingoes (*Phoenicopterus ruber*) in Essex, Hampshire, Kent, Norfolk and Suffolk in 1961, because most (probably all) of the individuals involved belonged to one or other of the American races and were fairly certainly escapes. Similarly, as from the end of 1962 we shall no longer concern ourselves with records of Red-headed Buntings, in view of the great numbers of these birds which are imported annually into Britain and other countries of western Europe.

The principles and procedure followed in considering records were set out in our first report (*Brit. Birds,* 53: 155-156) and some comments were made (53: 157-158) on the presentation adopted in the systematic lists. In the present report, the same principles and methods are followed, but it is perhaps again worth explaining some of the points involved, because they help to clarify the systematic lists.

(i) The basic details given for each record are (1) county; (2) locality; (3) number of birds if more than one, and age* and sex if known; (4) if trapped or found dead; (5) date or dates; (6) observer or observers up to three in number, in alphabetical order. Other relevant information is sometimes added at the end of individual records or in a subsequent paragraph.

(ii) Occurrences of species and some well-defined geographical races which have been recorded in Great Britain and Ireland (a) not more than ten times or (b) not at all during the previous 25 years are still published separately in this journal with full descriptions. British records in this category are mentioned briefly in the systematic lists below and, where possible, cross-referenced to the fuller publication.

(iii) The scientific nomenclature and classification follows that given in the B.O.U. *Check-list of the Birds of Great Britain and Ireland* (1952), with the amendments subsequently proposed (*Ibis,* 98: 157-168) and those resulting from the decisions of the International Commission for Zoological Nomenclature (*Ibis,* 99: 369). Any sight records of subspecies (including those of birds trapped and released) are normally referred to as "showing the characters" of the race concerned.

(iv) No record which would constitute the first for Great Britain and Ireland is published by us, even if we consider it acceptable, until it has been passed by the Records Committee of the British Ornithologists' Union.

*The term "adult" is used in the systematic lists to denote adult plumage irrespective of whether the bird has reached full maturity.

(v) In general, the report is confined to records which are regarded as specifically certain. "Probables" are never included and square brackets are used only to denote likely escapes from captivity. In the case of the very similar Long-billed and Short-billed Dowitchers (*Limnodromus scolopaceus* and *L. griseus*), however, we are continuing to publish indeterminate records and this will also apply to observations of frigate-birds (*Fregata*) and albatrosses (*Diomedea*), if and when they occur. On the other hand, we are discontinuing publication of indeterminate reports of Icterine and Melodious Warblers (*Hippolais icterina* and *polyglotta*), in view of the high proportion of instances which are definitely referable to one or the other.

Elsewhere in this issue will be found an editorial discussing some of the problems which arise in connection with the preparation and submission of observations to the Rarities Committee and, indeed, to regional and county organisations as well. It is hoped that the suggestions made there will be of assistance to observers when they submit records in future.

In the light of this editorial, the Committee has decided that from now on it will not normally ask an observer for further details of any record which seems to be his full and original account. It is felt that to do so is to invite distortion of the original notes made at the time. Observers will realise, therefore, that it is important to prepare as full and thorough an account as their observations will permit before they send a record to their county or regional committee, to a bird observatory or to us.

As stated in a previous report, we do not favour summaries or paraphrases of records, nor composite accounts combining the notes of several observers, and we hope that county editors and observatory authorities will continue to assist us as far as possible by forwarding original notes or accurate copies of them. We shall also be most grateful if records are submitted as soon as possible after being made, and not at the end of the year, as this greatly facilitates the preparation of reports.

In concluding the preamble to this report, we should like to convey our thanks to all those who have sent in their records, to a number of people who, on account of their special knowledge, have been of particular assistance to us, and perhaps especially to the many county editors and regional committees who have co-operated so patiently and efficiently.

Supplementary systematic list of 1959 records accepted

1959 **Red-crested Pochard** (*Netta rufina*)

Somerset: Cheddar Reservoir, ♂ and two ♀♀ or immatures, 9th December (W. Smith). Blagdon Reservoir, ♀ or immature, 27th December (W. A. Holmes, T. D. H. Merrie).

Tengmalm's Owl (*Aegolius funereus*) 1959

Orkney: Cruan Firth, 26th and 27th December 1959 and 1st January 1960 (see below) (E. Balfour, J. Wood).

Supplementary systematic list (with corrections) of 1960 records accepted

Cory's Shearwater (*Procellaria diomedea*) 1960

Co. Durham: near South Shields, 8th August (J. A. Bailey).

Frigate-bird (*Fregata* sp.)

Aberdeenshire: Forvie, 20th August (Mrs. R. Maxwell, A. J. M. Smith).

Little Bittern (*Ixobrychus minutus*)

Hampshire (correction): Titchfield Haven, one of the two recorded on 21st and 22nd May (*Brit. Birds,* 54: 180) was seen up to 26th May (N. H. Pratt).

Red-crested Pochard (*Netta rufina*)

Devon: Plym Estuary and adjoining waters, the ♀ reported in 1958 and 1959 (*Brit. Birds,* 53: 161; 54: 414) was present throughout 1960 and 1961 (L. I. Hamilton *et al.*).

Norfolk: Bayfield Lake, the ♂ reported in December 1959 (*Brit. Birds,* 53: 414) remained until 23rd January. Near Holt, ♂, shot, 26th January (R. P. Bagnall-Oakeley).

Somerset: Cheddar Reservoir: two ♂♂ and a ♀ or immature, 23rd November (T. D. H. Merrie, W. L. Roseveare).

Ferruginous Duck (*Aythya nyroca*)

Lincolnshire: Goxhill Marsh, adult, 4th to 26th September (S. van den Bos, D. A. Robinson).

Middlesex: Brent Reservoir, adult, 24th September (L. A. Batten, C. G. Munday); a ♂ at the same reservoir, 8th to 11th September, has already been recorded (*Brit. Birds,* 54: 181).

Northumberland: Gosforth Park, adult ♂, 13th February (G. F. A. Munns).

Snow Goose (*Anser caerulescens*)

Lanarkshire: Libberton, adult, blue phase Lesser Snow (*A. c. caerulescens*), 16th October to end of year (R. Erskine-Hill *et al.*); this is believed to have been the adult blue-phase bird reported in the spring of 1960 (*Brit. Birds,* 54: 182).

Midlothian/Berwickshire: Fala Moss, 15th to 23rd October, and Hule Moss, 13th to 19th November, adult white phase (W. Brotherston, W. M. Logan Home *et al.*); this may well have been the white-phase bird recorded in Lanarkshire in the spring of 1960 (*Brit. Birds,* 54: 182).

Kite (*Milvus milvus*)

Devon: Dartmoor, 18th October (A. A. Lock).

Kent: Waltham, 28th October (R. J. Ballard).

1960

Gyr Falcon (*Falco rusticolus*)

Dunbartonshire/Stirlingshire: River Endrick Estuary, 5th November (W. K. Richmond).

Upland Sandpiper (*Bartramia longicauda*)

Isles of Scilly: St. Mary's, 18th to 28th November (C. Keen, Miss H. M. Quick, R. Symons *et al.*).

Broad-billed Sandpiper (*Limicola falcinellus*)

Flintshire: Shotton Pools, two, 22nd September (R. J. Raines).

Mediterranean Black-headed Gull (*Larus melanocephalus*)

Hampshire (correction): the records were incomplete in our last report (*Brit. Birds,* 54: 186) and should read as follows: Eastney, adult, 6th and 13th March (M. E. Nolan, B. W. Renyard); adult, 8th October (M. W. Burnop, B. W. Renyard). Langstone Harbour, adult, 15th and 31st July (M. E. Nolan, G. H. Rees); adult, 5th and 26th November and 25th December (W. H. Truckle, E. J. Wiseman, A. Walker); second-winter, 27th November (D. F. Billett, M. E. Nolan, G. H. Rees *et al.*).

Norfolk (correction): Winterton, the second-winter bird recorded on 24th and 25th September (*Brit. Birds,* 54: 186) was also seen on 26th September (G. R. South) and 9th October (M. J. Seago).

Northumberland: Holy Island, adult, 8th September (M. Bell).

Suffolk: Lowestoft, the bird last seen on 19th March (*Brit. Birds,* 54: 177, 186) reappeared on 15th, 17th and 23rd October (F. E. Muddeman, N. Muddeman) and from 9th December to end January 1961 (D. J. Pierson).

Slender-billed Gull (*Larus genei*)

Sussex: Langney Point, first-summer, 19th and 22nd June and 6th and 10th July (R. H. Charlwood, D. D. Harber) (*Brit. Birds,* 55: 169-171).

Sabine's Gull (*Xema sabini*)

Suffolk: Walberswick, first-winter, 22nd September (D. J. Pierson).

White-winged Black Tern (*Chlidonias leucopterus*)

Suffolk: Reydon Marshes, near Southwold, two adults, 14th June (F. E. Muddeman).

Gull-billed Tern (*Gelochelidon nilotica*)

Flintshire: Shotton, 1st August (A. Bell, J. D. Craggs, R. J. Raines).

Tengmalm's Owl (*Aegolius funereus*)

Orkney: Cruan Firth, the bird of 26th and 27th December 1959 (page 565) was also seen on 1st January 1960 (E. Balfour, J. Wood).

Bearded Tit (*Panurus biarmicus*)

Kent (correction): Gravesend/Northfleet, the ♂ recorded from 13th December 1959 to 3rd January 1960 (*Brit. Birds,* 54: 189) remained until mid-February.

Yellow-browed Warbler (*Phylloscopus inornatus*) 1960

Stirling: Buchlyvie, 6th November (W. K. Richmond).

Richard's Pipit (*Anthus novaeseelandiae*)

Hampshire: The Gins, River Beaulieu, 4th October (R. H. Dennis).

Lesser Grey Shrike (*Lanius minor*)

Co. Durham (correction): the first-winter bird of 24th October (*Brit. Birds*, 54: 194) occurred at Tursdale (not Tinsdale) sewage-farm.

Systematic list of 1961 records accepted

White-billed Diver (*Gavia adamsii*) 1961

Fair Isle: adult, 14th May (G. J. Barnes, P. Davis, R. M. Nedderman).

Cory's Shearwater (*Procellaria diomedea*)

Cornwall: six miles WNW of Wolf Rock Lighthouse, 18th September (W. H. Dady). Off Land's End, 23rd September (M. F. M. Meiklejohn).

Isles of Scilly: off St. Mary's, 23rd September (M. F. M. Meiklejohn).

Purple Heron (*Ardea purpurea*)

Flintshire: Shotton Pools, 24th September (perhaps as early as 9th) to 15th October, and 18th to 22nd November (D. L. Clugston, A. Douglas, R. Reading *et al.*).

Kent: Sandwich Bay, 30th July (G. Dunkling, D. F. Harle, J. Websper *et al.*). Romney Marsh, juvenile, 9th August (D. F. Musson).

Isles of Scilly: Tresco, first-summer, 29th April (A. B. Watson). St. Mary's, two on 27th April, three from 29th April to 12th May, two up to 19th May, last one left 23rd May (G. J. Harris, P. Z. Mackenzie, R. Symons).

Little Egret (*Egretta garzetta*)

Anglesey: Afon Alaw Estuary, 5th to end August (T. J. Roberts, C. F. Tunnicliffe, L. S. V. Venables *et al.*). Malltraeth, from 2nd September (J. R. Whitelegg, P. H. G. Wolstenholme) until found dead, 31st January 1962 (P. Hope Jones). These records refer to the same individual.

Devon: Braunton Marsh, 1st to 10th May (J. C. Cooke, A. J. Vickery, Miss D. Wilson). Budleigh Salterton, 13th June (R. H. Baillie). Axe Estuary, 16th June (D. Bicknell, R. Cottrill, F. R. Smith). The last two records probably refer to the same bird.

Dorset: Lodmoor Marsh, Weymouth, 17th, 28th and 29th June (I. Bellamy, C. Walker).

Orkney: Isbister Oyce, Rendall, 30th July to 5th August (E. Balfour).

Shetland: between Loch Spiggie and Loch Brow, 11th to 13th June (R. J. Smith, J. Swan, J. Young).

Night Heron (*Nycticorax nycticorax*)

Dorset: Radipole Lake, Weymouth, adult, 25th November (M. R. Shepherd).

Hampshire: Lyndhurst, 14th June (P. L. Britton).

Isles of Scilly: St. Mary's, two adults, 29th April; one adult and one juvenile, 30th April to 13th May, the juvenile remaining until 2nd June (P. Z. Mackenzie, R. Symons).

There were again reports of Night Herons from the Edinburgh district, but a number of these birds live ferally in the zoological gardens there (*Brit. Birds,* 53: 159-160; 54: 179).

Little Bittern (*Ixobrychus minutus*)

Surrey: Weybridge, adult, found dead, 22nd August (R. K. S. Richards).

White Stork (*Ciconia ciconia*)

Lancashire/Westmorland/Cumberland/Dumfriesshire: various places, 4th to 19th April (P. Carah, H. H. Lancaster, R. T. Smith *et al.*).

Hertfordshire: near Cheshunt, the bird present in December 1960 (*Brit. Birds,* 54: 180) was last seen on 15th January (C. Wisley).

Kent: Manston, 5th February to 23rd April (G. Dunkling, D. F. Harle, D. C. H. Worsfold *et al.*).

A White Stork escaped from Chessington Zoo, Surrey, early in the year.

Teal (*Anas crecca*)

Drakes showing the characters of the American race, known as the Green-winged Teal (*A. c. carolinensis*), were reported as follows:

Hertfordshire: Hilfield Park Reservoir, 11th and 15th November (B. L. Sage, E. H. Warmington).

Kent/Sussex: Midrips and Romney Marsh, 19th, 21st and 22nd March (C. J. Cadbury, J. L. F. Parslow, R. E. Scott *et al.*).

Midlothian: Gladhouse Reservoir, 21st October (D. G. Andrew, T. C. Smout).

A male of this race escaped from a collection at Bury St. Edmunds, Suffolk, in April 1961.

American Wigeon (*Anas americana*)

Kent: Isle of Sheppey, immature ♂, 28th October (J. Hori).

Red-crested Pochard (*Netta rufina*)
(except in the London area)

Buckinghamshire: Marlow gravel-pits, ♀, 6th April (Mrs. S. Cowdy).

Cornwall: Helston Park Lake and Loe Pool, ♂, 29th December (J. E. Beckerlegge, A. C. Sawle).

Devon: Plym Estuary and adjoining waters, ♀, throughout the year (L. I. Hamilton *et al.*) (*cf. Brit. Birds,* 53: 161 and 414).

Essex: Hanningfield Reservoir, ♂ in eclipse, 9th July to 13th August (S. Hudgell, A. P. Sines *et al.*). Abberton Reservoir, five, 13th August (R. E. C. Collins); thereafter the species was present, probably continuously, until 5th October (R. V. A.

Marshall, M. S. J. Snoxell *et al.*), two to four birds being involved except on 18th August when there were six (S. Cox); three on 22nd October (M. P. Taylor), up to five between 19th November and 2nd December (R. G. H. Cant, E. T. Levy *et al.*), six on 17th December (S. E. Linsell), and one ♀ on 26th December (R. V. A. Marshall, M. S. J. Snoxell).

Lancashire: Pennington Flash and adjacent water, two ♂♂, 14th and 15th March; one ♂, 16th March to 15th April (F. R. Horrocks, K. D. Prescott, W. A. Prescott *et al.*).

Northamptonshire: Hollowell Reservoir, ♀, 5th February (J. L. Moore).

Northumberland: Seaton Burn, two ♂♂, 8th to 13th July (B. Little, J. D. Parrack, E. Robson *et al.*).

Nottinghamshire: Holme Pierrepont gravel-pits, ♀, 12th and 13th April (P. M. Hope, A. H. Preston, W. Priestley, *et al.*); ♀, 23rd November to 17th December (P. M. Hope, H. Mayer-Gross, W. Priestley *et al.*). Hoveringham gravel-pits, 17th September for several weeks (B. D. Bell, A. R. Johnson, A. W. Preston, *et al.*).

Somerset: Cheddar Reservoir, two ♂♂ and two ♀♀, 29th to 31st October and 2nd November (S. H. G. Barnett, H. W. Neal, M. A. Wright *et al.*); ♂ and two ♀♀, 10th and 17th December (B. King, M. A. Wright *et al.*). Blagdon Reservoir, two ♂♂ and one ♀, 19th November and 19th December (P. Hending, B. King).

Sussex: Pagham, ♀, 16th to 30th March (W. W. A. Phillips, R. F. Porter, S. K. Reeves *et al.*).

Wiltshire: Upavon, first-winter ♂, 31st October (G. H. Forster, R. Whitlock).

Yorkshire: Hornsea Mere, ♂, 22nd April to 11th June; ♀, 25th May to 3rd June (G. R. Bennett, A. D. Buffey, B. Richards *et al.*); ♀, 3rd September (G. R. Bennett).

Ferruginous Duck (*Aythya nyroca*)

Devon: Burrator Reservoir, two, 23rd November (L. I. Hamilton).

Hertfordshire: Hilfield Park Reservoir, ♀, 26th November (E. H. Warmington).

Lancashire: Pennington Flash, ♂, various dates to 15th February (L. G. Brook, J. R. Whitelegg, J. P. Wilkinson, *et al.*); ♂, 17th December (J. R. Whitelegg). Heysham, adult ♂, 10th December (L. W. Knowles, H. Shorrock, P. H. G. Wolstenholme *et al.*).

Worcestershire: Lower Bittell, ♀, 3rd October (W. E. Oddie).

The occurrence in recent years of hybrid Tufted × Ferruginous Ducks (*A. fuligula* × *nyroca*) indicates the need for considerable caution in identifying immature Ferruginous Ducks.

Buffelhead (*Bucephala albeola*)

Buckinghamshire: Foscote Reservoir, ♂, 28th February to 8th March (B. Campbell, T. W. Gill, R. Hatton *et al.*).

Surf Scoter (*Melanitta perspicillata*)

Dorset: Portland Bill, ♂, 30th September (A. M. Macfarlane, K. D. Smith, D. W. Taylor).

Yorkshire: Spurn Point, ♂, 30th August (M. Densley, B. A. E. Marr, G. R. Naylor *et al.*).

Ruddy Shelduck (*Casarca ferruginea*)

Cheshire: Hilbre Island, two, 13th May (D. Hammond, D. Woodward); the possibility that these were escaped birds cannot be ignored.

Lesser White-fronted Goose (*Anser erythropus*)

Gloucestershire: Slimbridge, adult, 17th and 21st February (M. Davy, M. A. Ogilvie, P. J. Olney).

Norfolk: Cley, immature, 3rd to 8th February (R. A. Richardson). Yare Valley, two adults, 26th and 27th December (P. R. Allard, M. J. Seago, G. R. Smith).

Snow Goose (*Anser caerulescens*)

Co. Durham: Hartlepool, adult white phase, 11th September (P. Reid). Seaton Carew, adult white phase, 27th December (P. Harland, R. J. Lightfoot). These two records are believed to refer to the same bird (see under Yorkshire below).

Surrey: Enton ponds, adult white phase, 25th May to 1st June (G. S. Elliott, R. M. Fry, A. F. Mitchell *et al.*).

Yorkshire: Sealing Dam and Lockwood Beck, adult white phase, 12th June to end of year (D. G. Bell, F. G. Grey, P. J. Stead *et al.*); this and the Co. Durham records above almost certainly refer to one and the same bird.

Lanarkshire: Libberton, the blue-phase bird seen in autumn 1960 (page 565) stayed until 9th April (R. Erskine-Hill *et al.*) and then reappeared on 13th October, remaining well into 1962 (R. Erskine-Hill, W. K. Richmond *et al.*).

Lanarkshire/Peeblesshire/Dumfriesshire/Midlothian: various localities, adult white phase, 13th October and thereafter until spring 1962 (W. Brotherston, R. Erskine-Hill, W. K. Richmond *et al.*); this is believed to have been the same bird as that seen earlier in the year in Midlothian (below).

Midlothian: Fala Moss, adult white phase, evidently the same bird as seen the previous autumn in Midlothian/Berwickshire (page 565), 4th February to 4th March (W. Brotherston *et al.*).

Hugh Boyd, of the Wildfowl Trust, tells us that free-flying Snow Geese are probably escaping with increasing frequency from collections in various parts of the country. Lesser Snow Geese (*A. c. caerulescens*) are the most likely to escape; blue phase Lessers, or "Blue Geese", are rather less common and Greater Snow Geese (*A. c. atlanticus*) much rarer. Although some records of Snow Geese doubtless refer to wild birds, it is becoming increasingly difficult to decide which. Ross's Geese (*A. rossii*) are still scarce in captivity, but two escaped together in Gloucestershire and one in Dunbartonshire in 1961. A bird eventually identified as a Ross's Goose, and presumably one of these, was present in the Lune Valley, Lancashire, from 17th September into 1962 and then what was probably the same bird appeared at various localities in Yorkshire later in 1962.

Kite (*Milvus milvus*) (except Wales)

Berkshire: Boar's Hill, near Oxford, 27th July (D. Lack).

Kent: Sandwich Bay, 26th November (G. Harrison, J. Websper, D. C. H. Worsfold *et al.*).

Norfolk: North Walsham, 25th January to early February and 22nd March (C. Lacey). Cley, 15th to 18th February and 4th March (W. F. Bishop, R. A. Richardson). These two records are believed to refer to the same bird.

Suffolk: Minsmere, 28th November (H. E. Axell).

Worcestershire: Upper Bittell, 10th December (W. E. Oddie).

White-tailed Eagle (*Haliaëtus albicilla*)

Sussex: Selsey Bill, 30th July (R. F. Porter).

Gyr Falcon (*Falco rusticolus*)

Cornwall: Portquin, showing the characters of the Greenland race (*F. r. candicans*), 5th March (E. G. Roper, Miss D. Sewart).

Somerset: Chew Valley Reservoir, 5th November to early 1962 (P. J. Chadwick, G. Sweet, M. A. Wright *et al.*).

Midlothian: Fala Moor, a light-coloured bird, 15th November (W. Brotherston).

Red-footed Falcon (*Falco vespertinus*)

Devon: Woodbury Common, Exeter, adult ♀, 21st May (R. F. Moore, R. M. Moore).

Norfolk: Cley, ♂, 30th April and 1st and 16th May (B. Broughton, D. Bryant, R. A. Richardson *et al.*). Scolt Head, 16th June (R. Chestney).

Isles of Scilly: St. Agnes, 27th and 30th May and 1st June (J. L. F. Parslow, Mrs. R. E. Parslow, Miss H. M. Quick). St. Mary's, 3rd and 4th June (Mrs. J. N. Walsh, T. P. Walsh).

Surrey: Elstead, 13th May (R. M. Fry).

Sussex: Beachy Head, first-summer ♂, 20th May (K. D. Edwards, A. Quinn).

Yorkshire: Spurn Point, 21st June (P. J. Mountford).

Berwickshire: Hule Moss, Greenlow, ♀, dead several days, 15th October (S. J. Clarke, M. J. Henderson, D. G. Long *et al.*).

Inverness-shire: near Boat of Garten, 15th May (R. Clark, R. H. Dennis, A. Sudbury *et al.*).

Crane (*Megalornis grus*)

Cornwall: near Ruan Lanihorne, four, 15th November; two, 21st to 23rd November (G. Allsop, M. A. L. Cummins, H. C. Evans).

Devon: Dartington, at least four, one of which was caught and taken to Paignton Zoological Gardens, 16th November (W. P. Chubb, H. Collings).

Hampshire: Eastleigh, 2nd June (G. B. Westerhoff).

Lancashire: near Southport, four, 11th November (E. W. Allonby, J. D. Fielding).

Montgomeryshire: Cann Office, 2nd May (A. G. Trower).

[**Surrey:** Frensham Little Pond, 1st to 6th October (R. M. Fry, A. F. Mitchell).]

It seems possible that the records from Lancashire, Cornwall and Devon refer to the same party of four.

Little Crake (*Porzana parva*)

Somerset: Chew Valley Reservoir, 5th November (M. A. Wright).

Sociable Plover (*Chettusia gregaria*)

Dorset: near Wimborne, 6th to 24th April (J. S. Ash, J. W. Riley, K. B. Rooke *et al.*) (*Brit. Birds,* 55: 233-235).

Hertfordshire: Tring Reservoirs, 29th October (T. R. E. Devlin, A. R. Jenkins, L. Lloyd-Evans) (*Brit. Birds,* 55: 236).

Kentish Plover (*Charadrius alexandrinus*) (except coast from Wash to Hampshire and Isle of Wight)

Dorset: Ferrybridge, Portland, two, 29th September (Miss M. D. Crosby).

Co. Durham: Saltholme Poole, Teesmouth, 30th April and 1st May (J. A. Bailey).

Short-billed or Long-billed Dowitcher (*Limnodromus griseus* or *scolopaceus*)

Flintshire: Shotton Pools, 19th November (J. R. Whitelegg, P. H. G. Wolstenholme).

Kent: Grove Ferry, 29th October to 26th November (M. J. Carter, I. C. T. Nisbet, M. J. McVail *et al.*).

Upland Sandpiper (*Bartramia longicauda*)

Pembrokeshire: Skomer, 19th and 20th October (D. R. Saunders).

Greater Yellowlegs (*Tringa melanoleuca*)

Flintshire: Shotton Marsh, 23rd July (J. P. Wilkinson).

Lesser Yellowlegs (*Tringa flavipes*)

Cornwall: River Amble, 18th and 20th September (G. Allsop, Miss E. M. Whelan, Miss K. Orr Wilson *et al.*).

Essex: Foulness, 13th May (G. Downey, P. J. Finden).

Pembrokeshire: Skokholm, 9th and 10th October (Mr. and Mrs. R. O. Boyd, D. Glanville).

Terek Sandpiper (*Tringa terek*)

Cornwall: Melancoose Reservoir, near Newquay, 13th June (G. Allsop, J. E. Beckerlegge).

Baird's Sandpiper (*Calidris bairdii*)

Bedfordshire: Wyboston gravel-pits, 13th to 24th September (I. J. Ferguson-Lees, P. J. Kitchener, E. M. Wilkinson *et al.*).

White-rumped Sandpiper (*Calidris fuscicollis*)

Norfolk: Cley and Salthouse, 28th to 30th July (Miss E. Forster, Mrs. M. Meiklejohn, R. A. Richardson *et al.*).

Pectoral Sandpiper (*Calidris melanotos*)

Anglesey: Malltraeth, 3rd September (W. Mulligan, J. R. Whitelegg, P. H. G. Wolstenholme).

Cornwall: Ruan Lanihorne, 1st to 17th September (G. Allsop, M. A. L. Cummins). Marazion Marsh, two from 8th to 11th September and one on the 12th (W. H. Dady, A. H. Glanville, B. Pattenden *et al.*).

Devon: Lundy, 31st August to 2nd September (D. B. Iles).

Co. Durham: near Coxhoe, 12th to 14th and 28th to 30th September (D. G. Bell, E. Shearer, P. J. Stead *et al.*).

Flintshire: Shotton Pools, 4th September (R. P. Cockbain, G. Thomason, K. Williams).

Hampshire: Farlington Marshes, 6th to 29th September (G. H. Clay, G. H. Rees, E. J. Wiseman *et al.*).

Kent: Stoke, 12th August (L. A. Batten, J. M. Crocker, A. G. Verrall); 16th September (M. D. Kingswell).

Lincolnshire: Lincoln sewage-farm, 30th September to 11th October (K. Atkin, R. K. Cornwallis, A. D. Townsend *et al.*). Gravel-pit just over county boundary from Langtoft (Northamptonshire), 8th October (R. V. Collier, Mrs. M. L. Collier).

Lincolnshire/Norfolk: Wisbech sewage-farm, 17th to 21st September (W. J. C. Conn, D. I. M. Wallace, Mrs. K. A. Wallace *et al.*).

Isles of Scilly: Tresco, 31st August (A. H. Glanville). St. Agnes, 13th September (Miss H. M. Quick, R. C. Righelato, G. L. Scott *et al.*); 5th October (P. R. Colston, R. E. Emmett, D. I. M. Wallace *et al.*).

East Lothian: Tyninghame Estuary, 10th September (T. Boyd, I. B. Roy, W. M. Skene *et al.*).

Fair Isle: trapped, 16th to 29th September (P. Davis, R. H. Dennis, W. H. Truckle).

Sharp-tailed Sandpiper (*Calidris acuminata*)

Bedfordshire: Bedford sewage-farm, 4th to 11th September (J. N. Dymond, I. J. Ferguson-Lees, D. I. M. Wallace *et al.*).

Buff-breasted Sandpiper (*Tryngites subruficollis*)

Gloucestershire: near Slimbridge, 17th September (L. P. Alder).

Suffolk: Minsmere, 1st September (H. E. Axell, R. G. H. Cant, D. A. Rowlands *et al.*).

Broad-billed Sandpiper (*Limicola falcinellus*)

Co. Durham: Seal Sands and neighbouring pools, Teesmouth, 13th to 19th August (J. A. Bailey, F. G. Grey, P. J. Stead *et al.*).

Nottinghamshire: Nottingham sewage-farm, 23rd to 26th August (L. A. Brown, A. Dobbs, A. R. Johnson *et al.*).

Black-winged Stilt (*Himantopus himantopus*)

Essex: Havengore Island, two, 4th June (P. Rudge). Eastwood, 3rd November (A. W. Ellis).

Sussex: Sidlesham Ferry, 6th May (D. Langford) and 16th May (R. E. Goddard, B. A. E. Marr, M. Shrubb); presumably the same bird.

Wilson's Phalarope (*Phalaropus tricolor*)

Cornwall: Marazion Marsh, 15th June to 4th July (J. E. Beckerlegge, W. R. P. Bourne, J. L. F. Parslow *et al.*) (*Brit. Birds*, 55: 183-185).

Nottinghamshire: Burton Meadows, Nottingham, 16th to 28th July (E. T. Lamb, A. W. Preston, W. Priestley *et al.*) (*Brit. Birds,* 55: 185-186).

Ivory Gull (*Pagophila eburnea*)

Sussex: Porto Bello, Brighton, 19th November (A. B. Sheldon).

Outer Hebrides: Stornoway, 5th to 8th November (W. A. J. Cunningham, W. Matheson).

Mediterranean Black-headed Gull (*Larus melanocephalus*)

Cornwall: St. Ives, second-summer, 21st to 24th March (Miss M. J. Jones, N. R. Phillips); immature, 31st July (N. R. Phillips); adult, 4th August (J. E. Beckerlegge) to 6th August (N. R. Phillips); sub-adult, 6th to 13th August and various subsequent dates (N. R. Phillips), also 17th, 18th and 29th August and 6th, 7th and 13th September (J. E. Beckerlegge); adult in ragged plumage, 28th August to late September (J. E. Beckerlegge, N. R. Phillips); adult winter, 7th and 15th September and (probably same bird) 1st October (N. R. Phillips), also 4th and 20th October (J. E. Beckerlegge); second-winter, 1st October (N. R. Phillips); and adult winter, 9th December (N. R. Phillips).

Dorset: Radipole Lake, adult, 22nd October (M. Coath, J. Fortey, G. Nobbs). Portland Bill, at least two adults, 29th October (K. R. Crawshaw, D. Dale, J. Fortey *et al.*).

Co. Durham: Hartlepool, adult, 11th to 31st August, 20th and 22nd September, 21st to 28th October and fairly regularly in December (D. G. Bell, R. J. Lightfoot, P. J. Stead *et al.*).

Essex: The Naze, adult, 16th September (M. P. Taylor).

Hampshire: Portsmouth Harbour, adult winter, 31st August (G. H. Rees).

Kent: Dungeness, adult, 16th February (R. E. Scott). St. Mary's Bay, adult, 9th August (I. R. Beames).

Norfolk: Cley, adult, 19th February (R. L. Leavatt, C. F. Mann); first-summer, 9th May (R. A. Richardson).

Suffolk: Lowestoft area, adult, several dates to 31st January (D. J. Pierson), 16th to 20th February and 16th July (F. E. Muddeman, N. Muddeman *et al.*). Southwold, 14th April (D. J. Pierson).

Sussex: Selsey Bill, almost adult, 22nd May (M. J. Helps, R. F. Porter); adult summer, 4th August (L. A. Batten, R. F. Porter); adult winter, 27th August (R. L. K. Jolliffe, A. B. Sheldon). Porto Bello, Brighton, adult summer, 16th and 17th July (A. B. Sheldon); adult winter, 26th August (A. B. Sheldon); adult, 28th October and 19th November (A. B. Sheldon) and 3rd December (D. D. Harber). Shoreham, adult summer and adult winter, 25th July (A. B. Sheldon). Langney Point, second-summer, 26th July (D. D. Harber); moulting from first-summer, 2nd August (D. D. Harber).

Bonaparte's Gull (*Larus philadelphia*)

Devon: Sidmouth, immature, 30th October (I. C. T. Nisbet).
Sussex: Porto Bello, Brighton, immature, 20th June (A. B. Sheldon).

Sabine's Gull (*Xema sabini*)

Caernarvonshire: Bardsey, immature, 27th October (D. L. Clugston).

Cornwall: St. Ives, two adults, 16th July (N. R. Phillips); adult, 19th August (N. R. Phillips); adult, 22nd August (J. E. Beekerlegge, S. J. Madge, A. C. Sawle). Sennen, adult, 19th September (W. H. Dady).

Dorset: Peveril Point, Swanage, immature, 13th to 17th June (H. G. Alexander, Mrs. R. B. Alexander, D. Newham). Poole Harbour, immature, 18th June (Miss H. Brotherton, the late A. J. Bull). These two records are believed to refer to the same bird.

Isles of Scilly: St. Agnes, adult, 30th August (J. A. Burton, R. W. Coursey, R. C. Righelato *et al.*); between St. Agnes and St. Mary's, adult, 4th September (F. H. D. Hicks).

Yorkshire: Spurn Point, adult summer, 11th September (A. Archer, J. Cudworth).

White-winged Black Tern (*Chlidonias leucopterus*)

Anglesey: Aberffraw Estuary, 21st May (A. Dobbs, Mrs. H. Dobbs).

Bedfordshire: Stewartby, 16th and 17th May (J. N. Dymond, S. J. Haggie, P. J. Reay *et al.*).

Middlesex: Queen Mary Reservoir, adult summer, 13th May (C. Hughes, G. D. Moore *et al.*). Staines Reservoir, adult summer, 14th May (R. S. Brown *et al.*).

Yorkshire: Chelker Reservoir, near Ilkley, two, 13th May (W. F. Fearnley, C. E. Finney, Mrs. D. M. Pennock *et al.*). Hornsea Mere, juvenile, 19th August (G. R. Bennett).

Whiskered Tern (*Chlidonias hybrida*)

Middlesex: Staines Reservoir, adult, 24th and 25th June (R. J. Johns, M. Nobbs, D. Putnam *et al.*).

Gull-billed Tern (*Gelochelidon nilotica*)

Dorset: Portland Bill, 21st August (the late A. J. Bull, P. J. Morgan, M. D. Smith *et al.*).

Sussex: Langney Point, 27th April (D. D. Harber); 13th July (D. D. Harber). Selsey Bill, 11th May (M. A. Jennings); 28th May (S. F. Knight, A. A. K. Lancaster, B. A. E. Marr *et al.*).

Caspian Tern (*Hydroprogne caspia*)

Essex: Walthamstow Reservoirs, adult, 9th July (R. W. George, J. Fitzpatrick). Abberton Reservoir, adult, 6th August (J. Firmin). King George V Reservoir, adult, 26th and 27th August (B. S. Meadows, F. Riley).

Suffolk: Minsmere, adult, 16th July (H. E. Axell, O. Merne).

Sussex: Langney Point, 14th July (D. D. Harber).

Sooty Tern (*Sterna fuscata*)

Hampshire: Hurst, adult, 17th June (D. Poole, E. J. Williams, D. B. Wooldridge).

Snowy Owl (*Nyctea scandiaca*)

Angus: Glen Esk, from July to 18th October, when captured and taken to Edinburgh Zoological Gardens (D. Jenkins).

Tengmalm's Owl (*Aegolius funereus*)

Orkney: Stromness, 1st May (E. Balfour).

Alpine Swift (*Apus melba*)

Essex: The Naze, 24th September (A. Darlington).

Kent: Cliffe, 7th October (R. J. Elvy, C. A. Walker, C. E. Wheeler).

Pembrokeshire: Llanrhian, 29th August (R. A. Hinde, Mrs. F. R. J. Hinde).

Calandra Lark (*Melanocorypha calandra*)

Dorset: Portland Bill, 2nd April (J. S. Ash, R. J. Jackson, K. B. Rooke *et al.*) (*Brit. Birds*, 55: 44-46).

Short-toed Lark (*Calandrella cinerea*)

Fair Isle: 20th to 30th April (G. J. Barnes, P. Davis, J. A. Stout).

Nutcracker (*Nucifraga caryocatactes*)

Essex: Holland-on-Sea, 20th February (Mrs. C. Nuttall, G. G. Nuttall).

Bearded Tit (*Panurus biarmicus*) (except East Anglia)

Berkshire: near Thatcham, four, including at least one ♂, 5th March (P. D. Mann).

Essex: Bishop's Stortford sewage-farm, the party of eight present at the end of 1960 (*Brit. Birds*, 54: 189) was still there in January, but the number had fallen to five by 19th February and to three by 5th March, the last date on which any were seen (R. J. Dowsett *et al.*). Walthamstow Reservoirs: up to fifteen in January (*Brit. Birds*, 54: 189) and early February (J. Fitzpatrick, B. S. Meadows), but numbers then fell; three were present during March and until at least 23rd April (J. Fitzpatrick); one on 29th April (B. S. Meadows). Nazeing: seventeen on 12th October and four on the 21st, all having crossed into Essex from Rye Meads (see under Hertfordshire below) (T. W. Gladwin *et al.*). Rainham: six to ten, 13th December; a few later in the month (M. J. Ardley).

In addition to the above, there were records in a number of localities in the north-east, east and south-east of Essex between January and early April and from mid-October onwards, while a pair was present in the eastern half of the county during the late spring and early summer.

Hampshire: Fleet Pond, ♂ and ♀, 9th December (N. H. Pratt).

Hertfordshire: Wilstone Reservoir, Tring, five, 29th February (Mrs. S. Cowdy); two, 1st November (Mrs. S. Cowdy); ♀ and immature ♂, 4th November (L. A. Batten, A. R. Mannering, R. F. Porter); two, 18th November (H. C. Dunk); three, 30th December (H. C. Dunk). Rye Meads, seventeen, 12th October (L. Lloyd-Evans); four, 21st October (T. W. Gladwin).

Hertfordshire/Buckinghamshire: Marsworth Reservoir, Tring, ♂ and ♀, 5th November (H. Cole, Miss P. D. Hager).

Kent: Swanscombe Marshes, five present at the end of 1960 were still there until at least 26th February (Mrs. W. I. Brewer, M. J. Carter, J. M. Crocker *et al.*); up to

LATE 81. Above, nmature Lapwing *Vanellus vanellus*) ith its buff-edged ing-coverts, short rest and ill-defined ace pattern, 27th uly 1960 (page 586). ight, adult Ringed lover (*Charadrius iaticula*) with com-lete black bands on ead and breast, 30th uly 1962 (page 587) *hotos: Eric Hosking*)

PLATE 82 Above, Snipe (*Gallinago gallinago*), 27th July 1960; though it looks conspicuous here, its bars and stripes of black, brown and buff camouflage it well in reed stubble (page 585). Left, Black-tailed Godwit (*Limosa limosa*) with the whiter eye-stripe of winter, 27th July 1960 (page 588)

PLATE 83 (*opposite*). Top, juvenile Ruff (*Philomachus pugnax*) with its bold back pattern and very small head, 27th July 1960 (page 586). Right, Avocet (*Recurvirostra avosetta*) with its striking pied plumage, long blue legs and slender up-curved bill, 27th July 1960 (page 589) (*photos: Eric Hosking*)

PLATES 84 and 85. Top left, Common Sandpiper (*Tringa hypoleucos*), 27th July 1960; note the white extending up towards the mantle and emphasising the olive-brown bib. Centre left, Green Sandpiper (*T. ochropus*) with the distinct spots of summer dress, 7th August 1960. Bottom left, Greenshank (*T. nebularia*), 7th August 1960; note the pale head and whitish under-parts (page 589). Above, Redshank (*T. totanus*), 1st August 1962. Below, Spotted Redshank (*T. erythropus*) in black summer dress, 28th July 1960, and (*inset*) in the winter grey-and-white, 27th September 1961; note the long bill and legs, and other differences from Redshank (page 586). (*photos: Eric Hosking*)

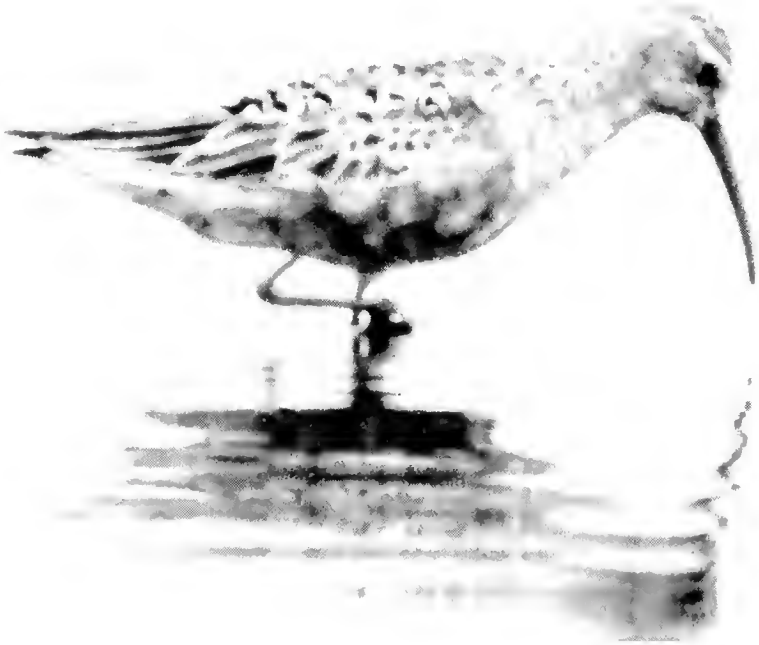

PLATE 86. Above, Curlew Sandpiper (*Calidris testacea*) moulting from the red of summer to the grey of winter, 1st August 1960; only the edge of the white upper tail-coverts can be seen here, but note the longer bill and less hunched appearance compared with Dunlin (page 589). Left, adult Dunlin (*C. alpina*) with the black belly and chestnut upper-parts of summer plumage, 29th July 1962. Below, Dunlin in first-winter dress, 28th September 1961 (pages 586, 589) (*photos: Eric Hosking*)

PLATE 87. Above, young Little Stint (*Calidris minuta*) showing one of the two pale stripes along the back which meet to form a V, 23rd September 1961; note the short bill (page 589). Below, young Sanderling (*Crocethia alba*) with pale breast and chequered upper-parts, 27th September 1961 (page 589). *By courtesy of Dr. Hackney*

PLATE 88. Above, Turnstones (*Arenaria interpres*) (male on right) starting to moult from their tortoiseshell summer plumage, 29th July 1962 (page 587). Below, Knots (*Calidris canutus*) showing the black-and-chestnut upper-parts of summer, but changing from red to grey below, 1st August 1960 (page 589) (*photos: Eric Hosking*)

four, 19th to 26th November, and up to six from then to the end of the year (M. J. Carter, K. D. Edwards, J. G. Sanders *et al.*). Northfleet area, two in October (L. A. Walker). Bessel's Green, near Sevenoaks, ♂, 10th December (V. C. Manley).

Lincolnshire: Gibraltar Point, two ♂♂, trapped, 30th March (A. D. Townsend).

Oxfordshire: Wolvercote, ♂ and two ♀♀, 4th to 19th November (M. H. Rowntree, C. J. Cadbury *et al.*); five on 15th November (R. S. Bailey).

Sussex: Pagham Harbour, at least two (♂ and ♀), 28th October to end of year (L. G. Holloway, W. W. A. Phillips *et al.*); at a neighbouring site, two ♂♂, 17th December (L. G. Holloway, N. F. Robson) and 27th December (G. J. Barker). Pett Level, six, 2nd November (F. J. Woolley); at least four, 4th November (D. D. Harber).

Yorkshire: up to four in one locality on several dates (*per* H. O. Bunce).

Dusky Thrush (*Turdus eunomus*)

Fair Isle: first-winter ♀, trapped, 18th to 21st October (C. Hodgkinson, P. Davis, S. L. White *et al.*).

American Robin (*Turdus migratorius*)

Orkney: Grimsetter Aerodrome, 27th May (R. O. Watson).

Gray-cheeked Thrush (*Hylocichla minima*)

Caernarvonshire: Bardsey, 10th October (Mrs. B. Clafton, F. R. Clafton, D. L. Clugston); the bird died and was later referred by C. Vaurie to the southern race *H. m. bicknelli*.

Desert Wheatear (*Oenanthe deserti*)

Hampshire: Farlington Marshes, ♀, 4th to 19th November (D. F. Billett, G. H. Clay, G. H. Rees *et al.*).

Cetti's Warbler (*Cettia cetti*)

Hampshire: Titchfield Haven, 4th March to at least 8th April, trapped 19th March (D. D. Harber, C. Suffern, M. H. Terry *et al.*).

Lanceolated Warbler (*Locustella lanceolata*)

Fair Isle: first-winter, 2nd to 14th October, trapped 13th (P. Davis, W. H. Truckle, E. J. Wiseman *et al.*).

River Warbler (*Locustella fluviatilis*)

Fair Isle: first-winter, 24th (trapped) and 25th September (G. J. Barnes, P. Davis, P. J. Slater *et al.*) (*Brit. Birds*, 55: 137-138).

Savi's Warbler (*Locustella luscinioides*)

Sussex: Selsey Bill, 10th, 11th, 17th and 18th April (R. L. K. Joliffe, R. F. Porter, M. Shrubb *et al.*).

Great Reed Warbler (*Acrocephalus arundinaceus*)

Devon: Slapton Ley, 7th August (F. R. Smith).

Aquatic Warbler (*Acrocephalus paludicola*)

Berkshire: Theale gravel-pit, 2nd August (J. T. R. Sharrock).

Dorset: Portland Bill, trapped, 31st August (R. Chainey, P. J. Morgan, D. A. Scott *et al.*); another trapped, 5th September (P. J. Morgan, R. S. Oddy, D. A. Scott).

Hampshire: Titchfield Haven, 24th September (D. Parr, M. D. Smith, M. H. Terry).

Kent: Dungeness, 24th September (D. I. M. Wallace, Mrs. K. A. Wallace).

Norfolk: Cley, 11th August (R. A. Richardson). Holme, 17th September (D. I. M. Wallace).

Pembrokeshire: Skokholm, trapped, 20th September (M. J. Crane, D. Glanville).

Somerset: Steart Point, 3rd September (B. Slade).

Sussex: Sidlesham, 18th September (M. Shrubb).

Melodious Warbler (*Hippolais polyglotta*)

Caernarvonshire: Bardsey, trapped, 30th August (F. R. Clafton, Mrs. B. Clafton).

Dorset: Portland Bill, one on 12th (trapped) and 13th August and two others (one trapped) on 13th (M. J. Carter, M. J. Cowland, K. D. Edwards *et al.*); one, 24th to 26th August (H. G. Alexander, the late A. J. Bull, M. D. Smith *et al.*).

Hampshire: Keyhaven Marshes, 2nd and 3rd September (D. Westerhoff, D. Wooldridge).

Hertfordshire/Essex: Rye Meads, 12th and 13th August (R. A. Broad, R. J. Dowsett, T. W. Gladwin *et al.*).

Irish Sea: on board S. S. *Tynwald* between Lancashire and Isle of Man, 3rd September (P. Cook, K. E. Hague).

Pembrokeshire: Skokholm, trapped, 12th August (M. J. Crane, D. Glanville).

Isles of Scilly: St. Agnes, trapped, 1st September (J. A. Burton, A. M. Hutson, R. C. Righelato *et al.*); one, perhaps two, 1st October, and one on 4th and 6th (P. R. Colston, R. E. Emmett, D. I. M. Wallace).

Somerset: Steep Holm, trapped, 27th September (P. J. Chadwick, Miss D. M Crampton, M. A. Wright).

Sussex: Selsey Bill, 12th August (B. A. E. Marr, R. F. Porter, A. B. Sheldon); 3rd September (A. B. Sheldon).

Icterine Warbler (*Hippolais icterina*)

Caernarvonshire: Bardsey, trapped, 23rd May (F. R. Clafton, Mrs. B. Clafton, Mrs. S. Cowdy *et al.*).

Dorset: Portland Bill, trapped, 3rd September (R. J. Jackson, J. H. Morgan, P. J. Morgan *et al.*); another trapped, 9th September (A. J. Hold, P. J. Morgan, P. J. Wilson *et al.*).

Kent: Sandwich Bay, trapped, 4th September (D. M. Batchelor, D. F. Harle, J. Websper *et al.*).

Norfolk: Blakeney Point, trapped, 11th August (R. A. Richardson); another trapped, 3rd October (R. A. Richardson).

Isles of Scilly: St. Agnes, trapped, 30th August (J. A. Burton, A. M. Hutson, R. C. Righelato).

Suffolk: Minsmere, trapped, 12th August (H. E. Axell).

Yorkshire: Spurn Point, 2nd to 6th September (D. G. Bell, P. J. Mountford *et al.*).

Fair Isle: trapped, 31st May (G. J. Barnes, P. Davis, A. F. G. Walker); 4th September (P. Davis, T. W. Gladwin, P. J. Slater *et al.*).

Olivaceous Warbler (*Hippolais pallida*)

Isles of Scilly: St. Agnes, 3rd and 4th October (P. R. Colston, R. E. Emmett, D. I. M. Wallace).

Subalpine Warbler (*Sylvia cantillans*)

Sussex: Pagham Harbour, 17th May (G. des Forges, A. A. Phillips, W. W. A. Phillips *et al.*).

Greenish Warbler (*Phylloscopus trochiloides*)

Kent: Dungeness, 24th September (D. I. M. Wallace, Mrs. K. A. Wallace).

Middlesex: Perry Oaks, 1st January to 26th February (B. E. Cooper, A. Quinn, D. I. M. Wallace *et al.*) (full details to be published).

Pembrokeshire: Skokholm, trapped, 30th and 31st August (M. J. Crane, D. Glanville).

Yorkshire: Redcar, 20th October (D. R. Seaward).

Fair Isle: trapped, 19th August (P. Davis, E. M. Wilkinson, P. J. Wilkinson *et al.*); 4th September (T. W. Gladwin, G. MacGregor, J. Shanks).

The Middlesex record, being in mid-winter, is of special interest.

Bonelli's Warbler (*Phylloscopus bonelli*)

Suffolk: Walberswick, 29th (trapped) and 30th April (S. Boddy, D. J. Pearson, M. Smart *et al.*) (*Brit. Birds*, 55: 277).

Fair Isle: first-winter, trapped, 22nd September (E. J. Wiseman, W. H. Truckle, S. L. White *et al.*) (*Brit. Birds*, 55: 278).

Arctic Warbler (*Phylloscopus borealis*)

Fair Isle: first-winter, trapped, 26th September (G. J. Barnes, P. Davis, E. J. Wiseman).

Fife: Isle of May, 5th and 6th September (J. A. D. Hope, J. E. King).

Yellow-browed Warbler (*Phylloscopus inornatus*)

Kent: Dungeness, trapped, 30th September (P. L. Britton, C. M. Perrins, R. E. Scott).

Isles of Scilly: St. Agnes, 14th October (G. J. Harris, P. Pearce, N. R. Phillips *et al.*).

Suffolk: Minsmere, trapped, 2nd October (H. G. Alexander, H. E. Axell, M. Coath).

Sussex: Selsey Bill, 17th September (A. B. Sheldon).

Yorkshire: Spurn Point, trapped, 5th October (G. R. Aynsley, P. J. Mountford, R. C. Parkinson).

Fair Isle: two (one trapped) on 1st October, one on 3rd and one on 9th and 10th, believed to be four birds in all (G. J. Barnes, P. Davis, P. J. Slater *et al.*).

Outer Hebrides: Isle of Shillay, Sound of Harris, 4th October (R. H. Dennis, W. J. Eggeling, J. M. Boyd *et al.*). Isle of Lewis, 6th October (the late S. L. B. Lee).

Dusky Warbler (*Phylloscopus fuscatus*)

Fair Isle: trapped, 14th October (R. Clive, P. Davis, C. Hodgkinson *et al.*) (*Brit. Birds,* 55: 190-192).

Radde's Bush Warbler (*Phylloscopus schwarzi*)

Norfolk: Blakeney Point, trapped, 3rd to 5th October (R. Harris, R. A. Richardson, B. R. Spence *et al.*) (*Brit. Birds,* 55: 166-168).

Richard's Pipit (*Anthus novaeseelandiae*)

Berkshire: Cholsey, near Wallingford, 10th December (W. D. Campbell).

Cornwall: Wadebridge, 13th October (Mrs. E. L. Almond, W. E. Almond, Mrs. R. Weeks *et al.*).

Kent: Halstow Marshes, 3rd January (L. A. Batten, R. F. Porter, J. Spanos).

Yorkshire: Spurn Point, 21st October to 1st November (D. G. Bell, B. Richards, P. H. G. Wolstenholme *et al.*).

Fair Isle: 8th October (G. J. Barnes, P. Davis, P. J. Slater *et al.*); first-winter, trapped, 18th October (P. Davis, C. Hodgkinson, S. L. White *et al.*).

Tawny Pipit (*Anthus campestris*)

Cornwall: Porthkidney, near Lelant, 23rd September (M. F. M. Meiklejohn, L. J. Reed).

Kent: Dungeness, 1st and 2nd September (R. E. Scott, D. Shepherd, L. P. Tucker *et al.*); 16th September (G. J. Harris, R. E. Scott, D. R. Watson).

Pembrokeshire: Skokholm, 19th September (R. W. George, D. Glanville, J. G. Shepherd *et al.*).

Isles of Scilly: St. Agnes, 14th to 18th May (J. L. F. Parslow, Mrs. R. E. Parslow, J. P. Rood *et al.*); 10th October (P. R. Colston, R. E. Emmett, D. I. M. Wallace).

Sussex: Langney Point, 19th September (D. D. Harber).

Outer Hebrides: Isle of Lewis, 23rd October (the late S. L. B. Lee).

Red-throated Pipit (*Anthus cervinus*)

Dorset: Portland Bill, 13th November (P. J. Morgan).

Isles of Scilly: St. Agnes, 13th and 14th May (G. J. Harris, J. L. F. Parslow).

Outer Hebrides: St. Kilda, 7th to 10th October (W. E. Waters).

Yellow-headed or Citrine Wagtail (*Motacilla citreola*)

Fair Isle: first-winter, 4th to 13th September (G. J. Barnes, P. Davis, R. H. Dennis).

Lesser Grey Shrike (*Lanius minor*)

Anglesey: Holyhead Mountain, 26th May (Mrs. C. A. Brook, L. G. Brook, C. F. Tunnicliffe *et al.*).

Cornwall: Allet, near Truro, 9th June (G. Allsop).

Devon: Lundy, 24th September (A. J. Vickery).

Flintshire: Shotton Pools, 21st and 22nd September (A. Baldridge, C. Carter, R. J Raines *et al.*).

Yorkshire: Cayton, near Scarborough, 4th July to 27th August (R. H. Appleby, P. J. Stead, A. J. Wallis *et al.*).

Ayrshire: Barr, 15th, 17th, 18th and 24th June (A. B. Duncan, G. Hughes-Onslow, A. D. Watson).

Woodchat Shrike (*Lanius senator*)

Gloucestershire: Coombe Canal, near Cheltenham, adult, 6th June (P. H. Dymott).

Kent: Dungeness, adult, 11th June (P. J. Grant, G. J. Harris, R. E. Scott).

Isles of Scilly: St. Agnes, adult, 27th May (J. L. F. Parslow, Mrs. R. E. Parslow).

Yorkshire: Spurn Point, adult, 31st May (Miss E. A. W. Gill, P. J. Mountford, Mrs. O. M. Pennock).

Red-tailed Shrike (*Lanius cristatus*)

Norfolk: Walcott, first-winter, trapped, showing the characters of the *isabellinus* group, 10th to 14th September (M. J. Carter).

The taxonomy of the Red-tailed or Isabelline Shrikes, now regarded as conspecific with the Red-backed Shrikes, was discussed briefly in *Brit. Birds,* 53: 427-428 and 54: 195.

Rose-coloured Starling (*Sturnus roseus*)

[**Essex:** Southminster, adult, 30th September to end of year (J. Firmin, R. Hudson, C. Stammers *et al.*).]

[**Gloucestershire:** Tewkesbury, adult, 17th July (F. Broxton, E. C. Heath, J. Oliver).]

Fair Isle: juvenile, trapped, 1st to 14th September (G. J. Barnes, P. Davis, R. H. Dennis *et al.*).

As pointed out in our last report (*Brit. Birds,* 54: 195), Rose-coloured Starlings are being increasingly imported as cage-birds, and, as there are reasons to suggest that the Essex and Gloucestershire birds may have escaped from captivity, these records are placed in square brackets.

Arctic Redpoll (*Carduelis hornemanni*)

Northumberland: St. Mary's Island, Whitley Bay, two, 31st December (J. D. Parrack) and 1st January 1962 (C. Douglas); Holy Island, 31st December and again on 1st January 1962 (S. R. Stobart, R. M. Wood).

Fair Isle: one adult and three juveniles (two juveniles trapped), 19th October (G. K. Brown, P. Davis, S. L. White *et al.*).

There is some disagreement among taxonomists about the classification of the redpolls. Meanwhile, it is considered desirable to record under Arctic Redpoll any birds which show the characters associated with *hornemanni,* although the whitest examples of *flammea* may be inseparable in the field even under the most favourable conditions (see *Brit. Birds,* 54: 238-241).

Serin (*Serinus canarius*)

Gloucestershire: Slimbridge, 13th and 16th July (L. P. Alder).

Hampshire: Farlington Marshes, 4th November (J. T. R. Sharrock).

Kent: Dungeness, 29th May (R. E. Scott).

Lincolnshire: Gibraltar Point, 16th May (A. D. Townsend).

Yorkshire: Spurn Point, trapped, 13th April (P. J. Mountford).

Scarlet Grosbeak (*Carpodacus erythrinus*)

Fair Isle: at least five different birds were present in the autumn—three on 4th September, two on 5th and one on 6th (P. Davis, B. Nau, T. W. Gladwin *et al.*); one, 9th to 12th September (G. J. Barnes, P. Davis, P. J. Slater *et al.*); one, 6th to 8th October (G. J. Barnes, P. Davis, S. L. White *et al.*).

Scarlet Grosbeaks are imported and sold as Rose Finches. However, there is little doubt that the Fair Isle records, all of female or immature birds, refer to genuine vagrants.

White-throated Sparrow (*Zonotrichia albicollis*)

Hampshire: Needs Oar Point, 19th May (and possibly previously on the 5th) (J. T. R. Sharrock) (*Brit. Birds,* 54: 366-367 and 439-440).

[Red-headed Bunting (*Emberiza bruniceps*)

Anglesey: The Skerries, ♀, trapped, 19th to at least 26th September (P. Hope Jones, A. J. Mercer).

Devon: Lundy, adult ♂ on or about 25th July (F. W. Gade), from 12th to 21st August (Miss B. Moore) and on 27th August (D. B. Iles).

Hampshire: Keyhaven, adult ♂, 2nd July (R. W. Butler, W. E. Oddie, D. A. Whitehouse).

Kent: Dungeness, adult ♂, 10th June (P. J. Grant, G. J. Harris, R. E. Scott).

Norfolk: Cley, adult ♂, 2nd and 3rd May (W. F. Bishop, Mrs. R. Palmer, R. A. Richardson). Salthouse, adult ♂, perhaps the same bird, 13th and 14th May (S. Whitworth). Breydon, adult ♂, 13th and 20th May (P. R. Allard).

Pembrokeshire: Skokholm, adult ♂, 19th to 25th September (R. W. George, J. G. Shepherd).

Isles of Scilly: St. Martin's, adult ♂, 28th May (J. Abbott).

Sussex: Beachy Head, adult ♂, 11th, 14th and 16th September (B. E. Cooper, J. F. Cooper, M. E. Nolan).

Yorkshire: Knaresborough Sewage farm, adult ♂, 20th and 21st September and 28th October (J. R. Mather, G. R. Wilkinson, C. Worrin).

Buteshire: Little Cumbrae, adult ♂, 11th June (N. F. Stewart).

Fair Isle: adult ♂, trapped, 20th and 21st April (G. J. Barnes, P. Davis, J. Wilson); adult ♂, trapped, 5th to 7th June (G. J. Barnes, P. Davis, M. A. Ogilvie *et al.*).]

As previously stressed, large numbers of Red-headed Buntings, particularly males, are imported annually into Britain and other west European countries, and it is certain that all, or almost all, British records refer to escaped birds. We shall not in future include this species in our reports while this situation prevails.

Yellow-breasted Bunting (*Emberiza aureola*)

Fife: Isle of May, 7th October (J. M. S. Arnott).

Little Bunting (*Emberiza pusilla*)

Anglesey: The Skerries, 25th September (P. Hope Jones, A. J. Mercer).

Fair Isle: at least seven individuals—one, 4th and 5th September (P. Davis, T. W. Gladwin, B. Nau); one, trapped, 13th and 14th September (P. Davis, E. J. Wiseman, S. L. White *et al.*); one, 21st, 24th, 25th and 27th September, probably the same bird in each case (G. J. Barnes, P. Davis, P. J. Slater *et al.*); two, 1st October, and one on 3rd, 4th, 6th and 7th (G. K. Brown, P. Davis, P. J. Slater *et al.*); one, 13th October (P. Davis); one, 27th and 28th October, and probably the same bird on 1st and 9th November (R. Clive, P. Davis).

APPENDIX—OBSERVATIONS IN "RECENT REPORTS AND NEWS" NOT NOW ACCEPTED

The following records appeared in "Recent reports and news", but were found to be unacceptable upon fuller consideration. The list includes all records of this kind, unless the references in "Recent reports and news" were qualified by such terms as "apparent" or "probable", or unless they appeared in brief summaries without precise date or location. There are a few other observations on which a final decision has yet to be reached.

We should like to stress again that, in our view, published rejection in no way implies a slur on the observer. Indeed, some of the records were submitted tentatively in the hope that we might be able to arrive at a conclusion, and in a number of cases we considered the identification to be probably correct, but the evidence was insufficient or the conditions of observation too unsatisfactory for unqualified acceptance as a fully authenticated record.

Cory's Shearwater	Off Hartlepool, Co. Durham, 8th July (*Brit. Birds*, 54: 335)
Snow Goose	Lune Valley, Lancashire, 17th September and subsequently (55: 47) (see page 570)

Red-footed Falcon	Zennor, Cornwall, 17th September (55: 47)
Slender-billed Curlew	Grove Ferry, Kent, 14th May (54: 294)
Greater Yellowlegs	Holme, Norfolk, 6th May (54: 296)
Lesser Yellowlegs	Tayport, Fife, 7th February (54: 172)
Terek Sandpiper	Blagdon Reservoir, Somerset, 6th October (55: 47)
Peetoral Sandpiper	Minsmere, Suffolk, 9th August (54: 334)
Mediterranean Black-headed Gull	Folkestone, Kent, 8th-23rd March (54: 172)
	Spurn Point, Yorkshire, 21st Oetober (55: 48)
Sabine's Gull	Portland, Dorset, 19th September (55: 48)
Gull-billed Tern	Herne Bay, Kent, 8th May (54: 294)
	Minsmere, Suffolk, 8th June (54: 294)
	Dungeness, Kent, 24th August (55: 48)
Caspian Tern	Folkestone, Kent, 16th March (54: 172)
Sooty Tern	Exe Estuary, Devon, 12th September (55: 48)
Bee-eater	Camberley, Surrey, 9th April (54: 295)
Red-rumped Swallow	Buckleberry, Buekinghamshire, 31st August (54: 447)
Greenish Warbler	Whitley Bay, Northumberland, 17th September (54: 444)
Yellow-browed Warbler	The Naze, Essex, 16th Mareh (54: 172)
	Skokholm, Pembrokeshire, 14th Oetober (54: 444)
Alpine Aecentor	Pett Level, Sussex, 12th October (54: 445)
Richard's Pipit	Spurn Point, Yorkshire, 11th September (54: 447)
	Braunton Marshes, Devon, 12th November (54: 447)
Tawny Pipit	Gilkieker Point, Hampshire, 5th September (two) (54: 447)
	Portland, Dorset, 17th September (54: 447)
Masked Shrike	Bamburgh, Northumberland, 22nd Oetober (54: 446)
Serin	Dungeness, Kent, 12th November (two) (54: 295)
Two-barred Crossbill	Buekleberry, Buckinghamshire, 25th August (54: 446)
Yellow-breasted Bunting	Zennor, St. Ives, Cornwall, 17th September (54: 447)
Little Bunting	Spalding, Lincolnshire, 1st October (54: 447)

Some studies of waders at Minsmere

By H. E. Axell

Photographs by Eric Hosking

(Plates 80-88)

MINSMERE IS A RESERVE of some 1,500 acres in Suffolk, owned and managed by the Royal Society for the Protection of Birds. It includes 395 acres of low ground which has developed as an area of reed-swamp and open water through the deliberate flooding of grazing meadows during 1940-45. Salt water again covered the marsh when the sea broke through in 1953. During a generally dry East Anglian

summer, the meres nearer the shore become very shallow and have long edges bordered by extensive areas of exposed mud. The depth of humus on the clay, mainly from grass killed by the original salt water, is variable and in different sections at different times, depending upon rainfall and evaporation, provides suitable feeding areas throughout the period of the autumn passage of waders. Stretches of open water and bare mud are, however, slowly shrinking with the encroachment of common reed (*Phragmites communis*), and over the past four years much work has been carried out to increase the wader habitat and improve the view of these areas from several permanent hides. Reeds and other plants have been removed by cutting and bulldozing, and ditches and sluices have been made to control water levels. This work continues and for the present the main wader area near the shore covers some forty acres; two of the meres are fresh, two are slightly brackish and one, new and being extended, is salt.

From early November until the end of March, a high water level persists on the marsh and rain water covers much of the adjacent grazing land to varying depths. Throughout the winter the wet grassland is much favoured by Snipe (*Gallinago gallinago*) and disturbed flocks of 40-80 may be seen pitching into the dead reed-stubble on higher parts of the reserve. Here the camouflage of their mottled and barred, black and brown plumage (plate 82a) has the utmost advantage. No more than eight pairs breed at Minsmere and the winter population of a few hundreds, which builds up from the end of July, drops very sharply in late March. One very useful effect of the reed-cutting has been to increase the feeding and resting areas of Snipe to such an extent that as many as 300 may often be flushed from a half-acre of reed-stubble through which salt water has been allowed to percolate in summer. Scattered single Jack Snipe (*Lymnocryptes minimus*) also favour the new stubbles.

Only small numbers of other waders are seen in the winter. Ringed Plovers (*Charadrius hiaticula*) are especially scarce until mid-February. A few Grey and Golden Plovers (*Ch. squatarola* and *Ch. apricarius*) occur, but mostly in hard-weather movements. Black-tailed and Bar-tailed Godwits (*Limosa limosa* and *lapponica*) and Ruffs (*Philomachus pugnax*) turn up occasionally. Green Sandpipers (*Tringa ochropus*) are rare, but small numbers of Spotted Redshanks (*T. erythropus*) are always present in winter and, until the advent of the breeding season, generally outnumber the Redshanks (*T. totanus*).

The beginning of the spring passage of waders is marked, in late March, by increasing numbers of most of the species mentioned above and more especially by a build-up of Spotted Redshanks. Ruffs increase up to 30 in some springs, staying well into May and providing

an opportunity to witness changes in the plumage of the males. The small-headed, stretched-neck appearance, exemplified in plate 83a, becomes lost under the variously and vividly coloured collars of the full-plumaged cocks who even begin to display a little before, disappointingly, they all leave to breed somewhere to the east or north-east of Britain.

An increase in the number of Curlews (*Numenius arquata*) takes place before the passage of Whimbrel (*N. phaeopus*) which begins in mid or late April; the Whimbrels are fairly consistent with between four and ten moving north daily during May and singles more occasionally in June. One to three Common Sandpipers (*Tringa hypoleucos*) occur almost every day in May and there is a similarly thin passage of Greenshanks (*T. nebularia*). Dunlins (*Calidris alpina*) are not numerous in spring, reaching a peak of 50-60 in mid-April when birds with the richly-chestnut upper-parts and black bellies of full summer plumage may be seen with smaller numbers of those still in winter dress (plates 86b and 86c).

The pause between the spring and autumn passage is short and not very definite. Fewer migrant waders are to be seen from the end of May to the last week of June, but in this period single Grey Plovers, Turnstones (*Arenaria interpres*), Bar-tailed Godwits, Greenshanks, Ruffs, Whimbrels, Little Stints (*Calidris minuta*) and Sanderlings (*Crocethia alba*) occur occasionally; these probably include some non-breeders making a partial migration. The first definite autumn passage is of Lapwings (*Vanellus vanellus*) coming in from the sea in or about the second week of June; during the summer many, presumably of Continental origin, stop on the mud in front of the hides where the buff edges to the wing-coverts, the short crests and the indefinite facial patterns of the young birds (plate 81a) may be well seen.

Spotted Redshanks are becoming more regular and numerous on the Suffolk coast and nowadays there are only three or four weeks in the year when they may not be seen at Minsmere. Individuals in the full breeding plumage of sooty black, spotted with white on the mantle and wings, occur until the last week of May and then again from mid-June. Both in spring and summer, "black" birds and "grey-and-white" ones in winter plumage (plates 85b and 85c) occur together. Peak numbers are recorded between mid-August and early September when there have frequently been 40-50 and once 65 together. In all stages of plumage they are frequently and usefully seen with Redshanks (plate 85a) from which the winter-plumaged Spotted Redshanks are readily distinguished by their longer bills and legs, prominent superciliaries, lack of streaking on the breast, absence of wing-bar and generally whiter appearance. They feed with much more vigorous movements than the Redshanks and often half-sub-

merge their bodies in deep water. Their vocabulary away from the breeding quarters is generally limited to a cheerful *chew-eet*, but a special group-feeding muttering occurs continuously when a dozen or more are foraging together in a tight pack. A snatch of song, a musical *tew-u-wee* repeated five times, was heard once in May from a bird as it alighted.

While feeding conditions are at their best in late July and August, and this is coincident with the period of the strongest passage, a variety of waders can be seen very well in front of the permanent hides. Thirty-seven species have been recorded on the wader pools over the past four years, as many as 15 species being seen at one time on one three-acre mere. The extensive areas of newly exposed mud are particularly favourable to the short-billed plovers and the passage of Ringed Plovers is especially strong. Most of these are juveniles, lacking the adult's complete bands on head and breast (plate 81b) and, with mud-covered legs, looking like Kentish Plovers (*Ch. alexandrinus*). The latter also occur, but only very occasionally. During September there is a well-marked passage of small, dark Ringed Plovers, presumably of the Arctic race (*Ch. h. tundrae*); these birds are often chased by aggressive individuals of the commoner race. Little Ringed Plovers (*Ch. dubius*) are appearing more frequently, with one to three on most days in August and fewer in September.

The very distinctive trisyllabic whistle of the Grey Plover may be heard in almost any month, but more often in August when one still resplendent with the bold black under-parts of summer plumage—well shown in the frontispiece (plate 80)—may feed for a day or two on the mud around the meres. Golden Plovers do not often come down to the meres and good views of black-bellied birds in summer plumage are rare. However, one of the northern race (*Ch. a. altifrons*), with as much black on the under-parts as a Grey, spent 11 days on a small area of grass during the very cold May of 1962.

Minsmere has a generally clean beach so that few Turnstones are attracted there. However, small numbers (varying from two to eight) pass south on many days in the autumn from mid-July onwards and some spend short periods around the edges of the meres. Plate 88a shows an adult male (right) and a more dusky-crowned female beginning to moult out of their tortoiseshell summer plumage of chestnut, black and white, which is so conspicuous against a background of bare mud but effectively "loses" the birds on a stony beach. The photograph shows the stout, pointed bill which at Minsmere is most often employed to turn over plates of cracked, dried mud.

Curlews occur in all months, but the main autumn passage is strongest during August. In summer these long-billed birds make little use of the soft mud in the meres, but feed more commonly on

stony ground on the neighbouring hills. Small numbers come in at dusk to roost with the gulls around the edges of the shallow meres. The southward passage of Whimbrels takes place over the same period; five to ten are recorded on most days, but only singles come down to rest on the marsh.

Most irregular in numbers and times of occurrence are the two godwits, but red-bodied birds of either species may be seen on the meres at any time in late spring and summer. The summer-plumaged Black-tailed Godwit, with chestnut head, neck and breast, large white wing-bar and bold black-and-white tail, is perhaps the most spectacular of all British waders and the R.S.P.B. is proud to have helped its recolonisation in certain parts of the country. It is larger than the more uniformly coloured Bar-tailed Godwit and has noticeably longer legs. The straight bill (that of the Bar-tailed is slightly upcurved) is shown in plate 82b, as is the whiter, more prominent superciliary of a bird beginning to assume winter plumage. It feeds readily in deep water on the meres, whereas the Bar-tailed comes down to the marsh only to rest.

A considerable variety of "sandpipers" (*Tringa* and *Calidris* species) are attracted to the pools in summer and in 1962 two from North America were recorded: a Pectoral Sandpiper (*C. melanotos*) on 27th July and a White-rumped Sandpiper (*C. fuscicollis*) on eleven days between 20th August and 7th September. Another American wader, a Buff-breasted Sandpiper (*Tryngites subruficollis*), found the dry mud to its liking on 1st September 1961.

The more common sandpipers are frequently present in good numbers, and allied and similarly-plumaged species may often be seen side by side. Some waders can be more difficult to separate on the ground than in flight, and two species which certainly come into this category are the Green and Wood Sandpipers (*T. ochropus* and *T. glareola*). The Green Sandpiper shown in plate 84b, with the more distinct spots of breeding plumage, is very similar in that pose to the Wood, but has, in fact, darker upper-parts, a longer bill and darker legs. On the wing, of course, the pure white rump and black-looking upper-parts and underwing, as well as the clear, loud call, are an immediate distinction from the Wood Sandpiper. The latter is generally less numerous at Minsmere, but often up to ten or more of each species occur in August, with fewer in late July and early September. Sometimes confused with Green and Wood Sandpipers when seen on the ground at a distance, the Common Sandpiper is of daily occurrence in autumn. Numbers reach a peak of 30 or more in late July or early August. Plate 84a clearly shows the immediate difference, the white of the under-parts extending towards the upper mantle and emphasising the olive-brown sides of the breast.

Some Greenshanks stay for several days at Minsmere, in certain ditches and isolated pools, and individuals are occasionally recognisable, or so it is believed, by differences in the tone of their *tu-tu-tu* calls. When Greenshanks and Redshanks stand together on the meres, as they often do, the much paler heads and whiter under-parts of the former are outstanding (compare plate 84c with plate 85a).

The wader pools are not favoured by large gatherings of Knots (*Calidris canutus*). Groups of twenty or so are seen moving down the coast in autumn and small numbers occasionally spend a few days on the meres in August and September. Like other waders which are red in summer and grey-and-white in winter, Knots occur in all stages: the two adults shown in plate 88b still have most of the black and chestnut of the upper-parts and wing-coverts, but the deep russet of the face, breast and belly is giving way to the pale grey of winter plumage. In a similar stage of autumn moult is the Curlew Sandpiper (*C. testacea*) in plate 86a; this is another species which undergoes a dramatic change from red to grey before it becomes rather like the young winter Dunlin in plate 86c. As can be seen, however, it does not present such a hunched-up appearance. Only the edge of the Curlew Sandpiper's white upper tail-coverts shows in the photograph, but the typical down-curve of the long bill is clearly illustrated.

One or two Temminck's Stints (*C. temminckii*) appear in most autumns and occasionally in May, but Little Stints (*C. minuta*) are much more common and regular, up to 15 being present in early August and a few occurring as late as the end of October. Plate 87a, of a young bird, shows the species' short bill (shorter than the head) and one of the long golden-buff stripes along the back which meet near the rump to form the characteristic pale V-mark.

As well as working along the tide's edge, Sanderlings find food on the mud surface around the meres and they are seen there mostly from mid-July to mid-September in groups of two to four. The majority are young birds with pale breasts and black-and-white spangled upper-parts, scapulars and wing-coverts as shown in plate 87b.

In 1947, the same year that they returned to Britain to start a colony on what is now also an R.S.P.B. reserve at Havergate, 14 miles to the south, Avocets (*Recurvirostra avosetta*) bred at Minsmere. A few pairs again nested in the following year, but encroaching reed and changing water levels afterwards spoiled the habitat. In the past three years, however, Avocets have been turning up more frequently to Minsmere (plate 83b) and some work to provide suitable conditions has begun.

Eric Hosking's photographs of eighteen of the species which occur at Minsmere were all taken on the reserve in July, August or September of 1960-62.

Notes

Kestrels feeding on scraps dropped by picnic parties.—On 6th August 1962, while on holiday at Winterton-on-Sea, Norfolk, I was exploring the Winterton Dunes Nature Reserve when I noted some five Kestrels (*Falco tinnunculus*) hovering over quite a small area of the adjacent coastal sand-hills. As the day was warm and sunny, I thought that a close inspection of the dunes would probably reveal a high concentration of animal life. This indeed proved to be the case, but the species was man—in the shape of several picnic parties. I watched and found that the birds were actually dropping down to take small scraps of food discarded by the picnickers. Indeed, they were frequently alighting only a few feet away and remaining on the ground for several minutes, seeming quite unperturbed even where there was an unleashed dog. Apart from hovering overhead, the Kestrels were also using as observation posts the roofs of a coastguard hut and a small wooden refreshment kiosk, as well as the string of a child's kite on more than one occasion. They were quite indifferent to movement and I was able to film one of them from a distance of only fifteen feet without any concealment at all.

Local people informed me that, in the past, Kestrels in this area used to await the return of the small fishing boats and then snatch fish lying only a few feet from the men. D. A. P. Cooke

Lapwing's persistent attack on Fox.—At 4.55 a.m. on 13th May 1962 I was travelling along a road near Deene, which is about five miles from Corby, Northamptonshire, when I saw a Fox (*Vulpes vulpes*) picking its way through a narrow belt of trees and I stopped to watch. Carefully stalking into the open, it suddenly pounced and from almost between its feet arose a Lapwing (*Vanellus vanellus*). The bird, which presumably had a nest or young in the vicinity, flew over the Fox and began to dive at it in a most determined fashion. The attack was pressed home with great vigour and the Fox slowly retreated, snapping at the bird as it did so. This went on for some fifty or sixty yards before the Fox turned and loped away across the parkland. Although I have often watched Lapwings attack other birds, this is the first time I have seen one go for a mammal and it was its persistence which surprised me. N. L. Hodson

Unusual death of Herring Gull.—On 9th August 1962, while wandering on Brownsea, a small island in Poole Harbour, Dorset, we found a dead Herring Gull (*Larus argentatus*) hanging by one leg from a pine. The tree was one of many left split and broken by a

fire which ravaged the island years ago. These pines are regular perches for the Herring Gulls which breed profusely on the heather-covered slopes of the island. The dead bird was found to be trapped by its leg being lodged firmly in a crack in the wood. Presumably it had been unable to free itself and had died of starvation.

J. W. Riley and D. L. Miller

Owls feeding on young sea-birds.—During the summer of 1962 I came across two instances of owls feeding on young sea-birds on Skomer Island, Pembrokeshire. On 13th July I flushed a Short-eared Owl (*Asio flammeus*) from an area of bracken near the edge of a cliff. It was carrying something and binoculars plainly showed this to be a young Puffin (*Fratercula arctica*) still in the down stage and probably not more than a fortnight old. Short-eared Owls regularly hunt over the Puffin colonies on Skomer and it seems quite likely that downy chicks are occasionally taken by them.

The other instance took place a month later. On 15th August M. H. Saunders and I were collecting driftwood from the beach at the head of The Wick, when a Tawny Owl (*Strix aluco*) flew out from a small cave. In the cave were the wings of three young Kittiwakes (*Rissa tridactyla*) and a number of pellets. Some of the latter were made up of Rabbit (*Oryctolagus cuniculus*) and small mammal remains, but others contained the skulls of seven young Kittiwakes and a quantity of feathers and bones. The wings were from Kittiwakes which were old enough to fly, or nearly so, but the skulls were those of nestlings only about half grown. The cave concerned is in the largest colony of Kittiwakes on Skomer, but it is impossible to say whether the Tawny Owl had taken the young from the nests or whether they were ones which had fallen to the beach below. This is only the second record of a Tawny Owl on Skomer and it is of interest to add that the bird was still roosting in the cave on 9th September, a fortnight after all the Kittiwakes had left.

D. R. Saunders

Egg-eating by hen Blackbird.—On 22nd May 1962, while looking out of a ground-floor window into my back garden at Hemel Hempstead, Hertfordshire, I saw a hen Blackbird (*Turdus merula*) alight on the ground within about ten feet. She was carrying nearly three-quarters of a Blackbird's egg between her mandibles and she proceeded to sip and scoop out the contents. This went on for about half a minute, after which something frightened the bird and she flew over into an adjoining garden. I have been unable to trace any previous record of a Blackbird eating an egg in the wild.

Ian Woodward

Crossbills feeding on beechmast and hazel nuts.—A party of about sixteen Crossbills (*Loxia curvirostra*) stayed in the woods at Margaretting, Essex, from 27th July to 7th September 1962. During these weeks I and others frequently recorded them feeding on the nuts of beech trees (*Fagus sylvatica*) and H. J. Seymour also saw them taking those of hazels (*Carylus avellana*). In every case the nuts were ones still on the tree and the birds apparently cracked them quite easily. Neither beechmast nor hazel nuts are included among the foods of this species listed in *The Handbook*. ROSEMARY UPTON

[Beechmast has occasionally been recorded among the casual foods of immigrant Crossbills during previous irruptions—for example, F. R. Smith cited a Herefordshire record in his analysis of the 1956 invasion (*Brit. Birds,* 52: 8)—but we do not know of any other case of regular feeding on these nuts.—EDS.]

Reviews

The Return of the Osprey. By Philip Brown and George Waterston. Collins, London, 1962. 223 pages; 19 monochrome photographs. 21s. (proceeds to R.S.P.B. funds).

The title of this book does it less than justice, for the text covers much more than just the Osprey story. Additionally, it relates the main facts about the re-establishment of the Avocet and Black-tailed Godwit, and surveys the situation regarding certain other rarities such as the Bittern and Marsh Harrier.

The book opens with a brief but highly relevant foreword by R. S. R. Fitter. Then follow two chapters on the Osprey: one on the bird's return by Philip Brown, the other on its natural history by George Waterston. These constitute the main body of the work. What is in effect a second section begins with two chapters on the Avocet, its re-establishment and behaviour, by Gwen Davies and Philip Brown respectively. Then comes a chapter on the Black-tailed Godwit by Peter Conder, and finally, for extra good measure, one by R. S. R. Fitter on the resurgence of some other rare British breeding birds.

As indicated, the several species receive unequal treatment in terms of space, a fact which makes for a certain lack of balance in the whole. Perhaps that was unavoidable, and I hesitate to press it as a criticism. I must, however, unreservedly deplore the absence of an index. A book of this high standard should certainly have had one.

Fundamentally, I have nothing but praise. The book shows beyond all doubt that the R.S.P.B.'s adventurous decision to spend

time, manpower and money on these rare species has been fully justified by the results.

Pleasingly illustrated, and written in a direct style that clearly conveys the enthusiasm of its authors, *The Return of the Osprey* is sure to interest all who are intelligently concerned about birds and bird protection. It deserves every success, and should earn the R.S.P.B. a well-merited increase in public recognition and practical support.

K. G. SPENCER

The Birds of Suffolk. By William H. Payn. Barrie and Rockliff, London, 1962. 238 pages; 1 coloured plate and 10 plates of monochrome photographs. 45s.

Let it be said straight away that this is a sound book which can without hesitation be recommended to anyone interested in Suffolk birds. Indeed, the county is fortunate to have obtained within 30 years two such excellent works as the present one and *A History of the Birds of Suffolk* by C. B. Ticehurst, which was published in 1932, bearing in mind the low ebb to which ornithological observation and recording there fell between 1930 and 1950. Since the war, the establishment of the *Suffolk Bird Report*, of the R.S.P.B. reserves at Minsmere and Havergate, and of the ringing station near Walberswick, together with the general increase of interest in birds, has transformed the position and resulted in comprehensive coverage of the coastal belt. Inland, however, with the favourable exception of Breckland, many large areas remain neglected and the author has often had to rely on his own intimate personal knowledge.

He devotes the bulk of the book to the systematic list, treating 301 species in just under 200 pages. Information is given on distribution and status (including, where possible, changes in status during the present century, and other historical detail), and a good proportion of space is allotted to movements and migration periods. The accounts are pleasantly free from padding; they are widely based, reliable, concentrated and comprehensive, and have been kept relatively short by the exclusion of material not strictly of significance to Suffolk.

It is interesting to find that the remarkable increase of the Bullfinch has been proceeding for the past fifteen years, that the Crossbill has never quite died out as a Breckland resident during the past fifty years, and that the Dartford Warbler was a resident until perhaps 1939. It is surprising that there have been no records of Ortolan Buntings during the past hundred years, apart from one at sea off Lowestoft. The Red-backed Shrike has been steadily decreasing here, as elsewhere in Britain, but the statement that there has been no evidence of breeding north of Southwold since 1956 should now be extended northwards to include Benacre.

Repeatedly in the systematic list, reference is made to the impoverishing effects of disturbance as a result of increased human leisure and mobility, and, perhaps even more, the destruction of habitat by afforestation, ploughing of heathlands, drainage, wholesale removal of hedgerows, and recently by poisonous agricultural sprays. These changes are emphasised by some delightful glimpses of the past in a section on "The coast and countryside fifty years ago" contributed by Lt.-Col. J. K. Stanford, F. C. Cook and H. J. Boreham. They are further dealt with in very brief chapters on "Changes in the avifauna" and "Analysis of the county list". The last-named section suggests a reasonable balance between the number of species which have increased, or have bred in recent years, and those which have decreased or been lost as breeders; there are over thirty species in each category, after allowance has been made for several birds, such as the Sparrowhawk, Cuckoo, Tree and Meadow Pipits and Snow Bunting, which are not listed in the analysis but which are shown in the systematic list to have declined in numbers. However, some of the gains are marginal, such as the Kentish Plover which made a single unsuccessful breeding attempt in 1952, while all too many of them depend solely on the two oases provided by the R.S.P.B., which account for the inclusion of the Avocet, Sandwich Tern, Herring Gull, Lesser Black-backed Gull, Marsh Harrier and perhaps others.

One cannot avoid the impression that, over the county as a whole, the losses are far more significant than the gains, and that they are likely to be carried further before long. For example, there is no mention of any decrease of the Chaffinch or the Yellowhammer, both of which seem recently to have suffered severely in other parts of eastern England. However, the author, writing of west Suffolk which is the area he knows best, says he is sure the decrease embraces most species; he instances the Cuckoo, of which five or six formerly called all day long at his home in summer, but which now is not heard for days on end. Thus the book gives additional touches to the nation-wide picture, which seems to be emerging, of a general reduction in the numbers of many species—regarded by some as potentially a catastrophic collapse in certain cases.

Finally, there is a chapter on migration, which shows that the author has long been aware of the merit of keeping a close watch on movements and numbers within defined areas inland, in the same way as the inland observation posts now being established elsewhere are doing. Of course, in a county like Suffolk much more movement has always been apparent on the coast than inland; nevertheless, it would have been possible to increase the impressiveness of the accounts of the extent and duration of coastal visible migration if the very recent intensive year-round observations at Minsmere by the invariably

early-rising H. E. Axell had been made in the period covered by this book.

The absence of a proper map is aggravated by the publishers' claim on the jacket that there are two maps. These are, in fact, only end-papers which repeat at the front and back of the book a single pleasant outline sketch of the county, incorporating in appropriate places drawings of one or two typical birds such as the Avocet and Stone Curlew as well as a dozen or two of the more important towns and waterways. P. A. D. HOLLOM

Recent reports and news

By I. J. Ferguson-Lees

(These are largely unchecked reports, not authenticated records)

So far as unusual vagrants were concerned, the most remarkable feature of the autumn of 1962 was the unprecedented number of American birds which crossed the Atlantic between late July and mid-December, particularly in September and the first half of October. The summary which follows is confined to this one feature and other aspects of the autumn and early winter will be covered in a future issue. The August records, and some of the early September ones, were summarised in October (*Brit. Birds,* 55: 459), but most of them are now briefly mentioned again for the sake of completeness.

PASSERINES

In recent years one or two American Passerines have been recorded at large in the British Isles almost every autumn and there are now fourteen species on the British and Irish list. Nevertheless, 1962's total of six individuals of five species was quite extraordinary. All were in the south, as indeed were the majority of the other American birds. A **Bobolink** (*Dolichonyx oryzivorus*) on St. Agnes (Isles of Scilly) on 19th and 20th September has already been mentioned and it was St. Agnes which produced the next American Passerines. These were two **Red-eyed Vireos** (*Vireo olivaceus*) which stayed from 4th October to at least the 10th, after which one of them was seen alone on the 17th. Then on 5th and 6th October—note the coincidence of dates—a male **Baltimore Oriole** (*Icterus galbula*) was recorded at Beachy Head (Sussex), and on 7th and 8th October a first-winter male **Rose-breasted Grosbeak** (*Pheucticus ludovicianus*) was found on Cape Clear Island (Co. Cork). There is only one previous record of each of these last three species in the British Isles, and the Bobolink has never been identified over here before. Finally, an **American Robin** (*Turdus migratorius*) appeared on Lundy (Devon) on 7th November, just ten years after the first one was recorded there (*Brit. Birds,* 46: 364-368).

Doubtless some of these birds spent a greater or lesser part of the journey on a ship. In fact, the Red-eyed Vireos were first noted just when the Dutch liner *Rotterdam* was passing St. Agnes on her way up the Channel towards Beachy Head! However the possibility of assisted passage no longer necessarily counts against a record (*Brit. Birds,* 48: 146-147; *Ibis,* 98: 156-157) and, indeed, happenings on ships can be of no little interest. For instance, at just about the time that the Red-eyed Vireos, Baltimore Oriole and Rose-breasted Grosbeak were recorded, the *Mauretania* was having a memorable crossing from America, in the course of which at least 130 American land-birds of some 35 species came on board after being

blown out to sea by hurricane winds. They included kinglets and various species of wrens, warblers and sparrows, as well as waxwings, doves, woodpeckers and flickers (but no vireos, orioles or grosbeaks). The incident will be reported fully in a future issue of *British Birds* and it must here suffice to say that, while most of the birds gradually disappeared and some died, a few made the whole journey. These included a **Yellow-shafted Flicker** (*Colaptes auratus*) which was seen to fly ashore at Cobh (Co. Cork).

The question of possible escapes from captivity has to be explored in the cases of Passerines such as these, even though very few North American birds are kept by European aviculturalists because of export restrictions on the other side. We shall therefore be glad to hear from anyone who may have any relevant information. We are following up the reports of a number of American birds being released at Falmouth (Cornwall) in the summer, but the general picture and the coincidence of dates suggest that at least the various October records are unlikely to have had any connection with these.

WADERS AND WATERFOWL

In any case, it was the waders which, as usual, formed the bulk of the American invasion and they raise no such problems. The previous summary mentioned that some 27 **Pectoral Sandpipers** (*Calidris melanotos*) had been reported and then went on to refer to another twelve waders of seven other species. The final total of Pectoral Sandpipers seems, in fact, to have been approximately 35 in about 18 counties and the list of other species almost doubled. Three **Lesser Yellowlegs** (*Tringa flavipes*) have already been mentioned, but a **Greater Yellowlegs** (*T. melanoleuca*) appeared at Shotton (Cheshire) on 3rd September and we hear that another was seen in Northern Ireland. Also in Cheshire, this time at Sandbach, there was a **Wilson's Phalarope** (*Phalaropus tricolor*) which stayed at least a fortnight from 10th September: this was the second of the autumn (the other was in Cornwall in August) and it brought the total of British records to ten although the species was not seen over here before 1954. But it was again the Isles of Scilly which produced the most surprises. Following a total of four **Pectoral Sandpipers** on St. Agnes and three **Buff-breasted Sandpipers** (*Tryngites subruficollis*) on St. Mary's earlier on (and not forgetting the Bobolink and Red-eyed Vireos), there came three more American waders to St. Agnes in the first week of October: an **American Golden Plover** (*Charadrius dominicus*) which stayed from 30th September to 10th October, a **White-rumped Sandpiper** (*Calidris fuscicollis*) on 2nd and 3rd October, and a **Least Sandpiper or American Stint** (*C. minutilla*) on 4th October (the same day as the vireos). The White-rumped Sandpiper was trapped and was the second to be ringed in Britain during the autumn (it may be recalled that the other was in Suffolk). Finally, a **Baird's Sandpiper** (*C. bairdii*) was located in Co. Kerry on 2nd October, and a **dowitcher** (*Limnodromus* sp.) stayed at Pitsford Reservoir (Northamptonshire) from 6th October into early November. With the three other species mentioned in the previous summary—**Semipalmated Sandpiper** (*C. pusilla*), **Solitary Sandpiper** (*T. solitaria*) and **Stilt Sandpiper** (*Micropalama himantopus*)—the autumn's total of American waders came to somewhere between 50 and 60 individuals of thirteen species. This was nearly twice as many as in any previous year.

Two more ducks came to grief. The second **Blue-winged Teal** (*Anas discors*) of the autumn, a male, was shot near Portumna (Co. Galway) on 17th October, and a first-winter male **American Wigeon** (*A. americana*) met a similar fate on Foulness Island (Essex) on 20th December. With the various Passerines, and the **American Bittern** (*Botaurus lentiginosus*) mentioned in the last summary, the grand total of American species in Britain in the last four months of 1962 was thus brought to 21.

SMALL ADVERTISEMENTS

12/- for 3 lines (minimum); 4/- for each extra line or part thereof. For the use of a Box Number there is an extra charge of 1/-.

The Dorset Naturalists' Trust requires a Warden for its Nature Reserve on Brownsea Island. Salary £500. Living accommodation provided. Apply Hon. Secretary, Burnage House, Martello Park, Canford Cliffs, Poole, for particulars.

Calf of Man Bird Sanctuary. Applications invited for the seasonal post of Assistant Warden for the period March to October 1963. Applicants should hold a ringing permit and have some experience of mist-netting. Remuneration £4 per week, plus quarters. Particulars from the Manx Museum & National Trust, Douglas, Isle of Man.

Cape Clear Bird Observatory, Co. Cork. Large species list, heavy sea passage. Attractive new accommodation 30/- per week. Write H. M. Dobinson, Old Barn, Sonning Common, Reading.

Handa Bird Reserve, Sutherland. Bookings now being taken for accommodation in newly equipped bothy. Charge 5/- per person per night. Free prospectus from R.S.P.B. Scottish Office, 21 Regent Terrace, Edinburgh 7.

Calf of Man Bird Observatory, off the south-west coast of the Isle of Man, will be open in 1963 from mid-March to mid-October. Ringers, mist-netters and other *bona fide* naturalists interested in helping the Warden with the work there will be welcome for periods of one week or longer. Accommodation is limited, and anyone interested should get further particulars from the Secretary, Manx Museum & National Trust, Douglas, Isle of Man.

Wanted. ¼-plate camera and equipment suitable for bird photography. Reasonable price. Box DR2611.

Required. *British Birds*, vols. 13, 14 and 15 in good order. Write Allpress, Wolvers, Reigate, Surrey.

For Sale. *British Birds* 1949, 1950, 1958, 1959, 1960 (all unbound). Offers, all or part. Box DR1810.

For Sale. *British Birds*, vol. 43 (1950) to vol. 50 (1957) bound; vol. 51 (1958) to vol. 55 (1962) unbound. Offers to J. R. Govett, 14 The Rowans, Bramhope, Yorks.

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Short index of English names of birds

This simplified index is confined to references in papers, notes and letters, and to plate numbers. Birds mentioned in reviews or in the "Recent reports and news" are not included, but such lists as the "Report on bird-ringing for 1961" and the "Report on rare birds in Great Britain in 1961" are completely indexed here.

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(2) scientific nomenclature under generic names only (following the 1952 B.O.U. *Check-list of the Birds of Great Britain and Ireland*, but without strict adherence to original orthography and amended as in *Ibis*, 98: 157-168 and 99: 369);

(3) authors of all papers, notes, reviews and letters, and photographers; papers are referred to by their titles, other contributions as "note on", "review of", etc.;

(4) a few subject headings, i.e. "Breeding", "British Trust for Ornithology field investigations", "Display", "Editorials", "Field-characters", "Food", "Hastings Rarities," "Migration", "Obituary," "Reports and news" and "Requests for information";

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